INDEPENDENT OVERSIGHT EVALUATION OF ENVIRONMENT, SAFETY, AND HEALTH PROGRAMS AT FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

May 1996

Office of Oversight
Environment, Safety and Health
U.S. Department of Energy

TABLE OF CONTENTS

This page intentionally left blank.

EXECUTIVE SUMMARY

EVALUATING ORGANIZATION:	**The Office of Oversight, which is the Department of Energy (DOE) Office of Environment, Safety and Health independent oversigh t organization**
SITE EVALUATED:	**Fernald Environmental Management Project (FEMP), commonl y called the Fernald site**
DATES OF EVALUATION:	**April to May 1996**
METHODS:	**The evaluation selectively sampled various Fernald managemen t systems, programs, facility operations a nd activities, and engineering systems that are considered essential to worker, public, an d environmental safety.**

BACKGROUND

The Fernald site is located just north of Fernal d, Ohio, 18 miles northwest of Cincinnati, Ohio. The plant and storage area s occupy 136 acres, and are situated on 1,050 acres of Federal land. The site wa s established in 1951 to produce uranium metal in su pport of defense activities. Production was suspended in July 1989 and formally ended in 1991. The current mission is site cleanup and environmenta l restoration.

Contractor activities at Fernald are man aged by DOE's Ohio Field Office (OH) and Fernald Area Office (FN), with programmatic direction provided by the DOE Headquarters Office of Environmenta l Management (EM). The contract to manage Fernald was awarded in 1992 to Fernald Environmenta l Restoration Management Corporation (FERMCO), a subsidiary of Fluor Daniel, Inc. The fiscal yea r 1995 budget for the operating contract was $271 million. Approximately 2,000 contractor and 5 0 government personnel were employed at Fernald in 1995.

The primary activities at the site are removal or dispositioning of all site nuclear materials an d decommissioning and decontamination of all site buildings and facilities. Although the Fernald site n o longer produces uranium metal, it continues to store materials once used there and at other DOE sites. The quantities of uranium, contaminated facilities, radioactive and mixed wastes, and thorium are th e site's principal radioactive hazards. Chemical hazards i nclude acids, caustic materials, various industrial chemicals, and process wastes. Construction, decontamination, and decommissioning activities als o present hazards, as does work in areas with high voltage, heavy equipment, and rotating machinery.

RESULTS

Three guiding principles for safety management formed the basis for the evaluation: 1) line managers are responsible and accountable for safety; 2) comprehensive requirements exist, are appropriate, and are executed; and 3) competence is commensura te with responsibility. These principles, and their associated criteria, represent the template for an effective safety management program.

Principle #1. Line Managers Are Responsible and Accountable for Safety.

EM, OH, FN, and FERMCO management understand and have embraced line management responsibility for safety, and have demonstrated support for safety as the site continues its transition to environmental restoration activities. Clear safety policies and goals have been established, and management initiatives, such as Safety First, are helping to achieve a strong safety culture at FEMP. Consideration of risk and environment, safety, and health (ES&H) requirements in overall project planning and budgeting is generally effective. Further, the Enhanced Work Planning demonstration project initiative has been shown to be successful at integrating reviews by safety professionals. FN, FERMCO, and subcontractors are effectively being held accountable for ES&H performance. FN has used the award fee plan effectively to refocus FERMCO priorities and promote improvement in ES&H programs. The impetus provided by the development of the Technical Management Plan (TMP), which defines the requirements for the site and is the DOE response to Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 93-4, has led to improvements in the FEMP safety management program.

However, improvement is needed in roles and responsibilities. In particular, the responsibilities of OH are not well defined, and the responsibilities for implementing all requirements defined in the TMP were not clearly communicated. Weaknesses in the area of roles and responsibilities contributed to a situation where contractors are operating in accordance with safety analyses that have not been adequately reviewed or approved by DOE.

Principle #2. Comprehensive Requirements Exist, Are Appropriate, and Are Executed.

FEMP has established the framework for an effective requirements program. Both FN and FERMCO have effectively implemented a comprehensive system for assuring that applicable requirements are identified and translated into work procedures. The FEMP hazards analysis process is effective. Although some problems were noted, the safety analyses are generally complete and appropriately consider hazards, and the hazard analysis activities performed at the project and task levels are effective in improving safety.

Most FEMP programs for implementing requirements (e.g., the radiation protection program) are well conceived, effectively implemented, and performed in compliance with requirements. The deficiencies are primarily concentrated in maintenance, including maintenance of electrical systems. While these deficiencies are significant and pervasive, they appear to be an exception in otherwise effective programs.

Although some aspects are effective, the DOE and FERMCO programs for assessing performance require improvement, most notably in conduct of assessments, managing corrective actions, and root cause analysis. The various elements of the program need to be performed in accordance with the TMP provisions, and an integrated approach to assessment of ES&H performance has not been institutionalized at the FEMP.

Principle #3. Competence Is Commensurate with Responsibilities.

With respect to safety, EM, OH, FN, and FERMCO have effectively responded to the considerable challenges associated with transitioning the workforce to its current mission. FN and FERMCO have sufficient personnel with the appropriate qualifications to perform required safety-related functions, although localized staff shortages and skill mix issues require further attention. FN and FERMCO managers and workers have practical experience and a good understanding of facility operations and

hazards. FN and FERMCO have established a number of effective programs to encourage worker participation and involvement in safety, although further strengthening of communications with workers on safety matters is needed. With few exceptions, workers generally were safety conscious and knowledgeable of hazards. The conduct, structure, and delivery of ES&H training provided by FERMCO is acceptable. Continued attention is needed to improve the Facility Representative program and technical qualification program, and increased management involvement in training is needed. However, on balance, FEMP has maintained a workforce with the needed competencies.

CONCLUSIONS

Based on this independent sample, safety management at FEMP is effective. OH, FN, and FERMCO have established approaches and initiatives that have resulted in sound and improving safety performance. Although FEMP faces significant challenges, such as coping with new hazards associated with mission change and continued downsizing of the workforce, FN and FERMCO are well positioned to meet these challenges. However, increased diligence and attention are needed to address the few systemic issues identified in this evaluation, particularly strengthening FN programs for assessing performance and corrective action and root cause efforts within both FN and FERMCO.

This page intentionally left blank.

ACRONYMS AND INITIALISMS

ALARA	**As low as reasonably achievable**
BIO	**Basis for Interim Operations**
DNFSB	**Defense Nuclear Facilities Safety Board**
DOE	**U.S. Department of Energy**
EH	**U.S. Department of Energy Office of Environment, Safety and Health**
EM	**U.S. Department of Energy Office of Environmental Management**
EPA	**Environmental Protection Agency**
ES&H	**Environment, safety, and health**
FEMP	**Fernald Environmental Management Project**
FERMCO	**Fernald Environmental Restoration Management Corporation**
FIP	**Fernald Implementing Procedure**
FN	**DOE's Fernald Area Office**
HWMU	**Hazardous Waste Management Unit**
IH	**Industrial hygiene**
IP	**Implementation plan**
IS	**Industrial safety**
M&TE	**Measuring and test equipment**
PM	**Preventive maintenance**
PMT	**Post-maintenance testing**
OH	**Ohio Field Office**
QA	**Quality assurance**
QC	**Quality control**
RCRA	**Resource Conservation and Recovery Act**
SAR	**Safety analysis report**
S/RID	**Standards/requirements identification document**
TMP	**Technical Management Plan**
WR/O	**Work request/order**

This page intentionally left blank.

INDEPENDENT OVERSIGHT EVALUATION OF ENVIRONMENT, SAFETY, AND HEALTH PROGRAMS AT FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

1.0 INTRODUCTION

The Office of Oversight evaluated safety management programs at the Fernald site during April and May 1996.

An independent oversight safety management[1] evaluation of t he Fernald site was conducted during April and May 1996 by the Office of Oversight, U.S. Department of Energy (DOE). The purpose of the evaluation was to determine how well DOE and contractor line management[2] have implemented safety management and environment, safety, and health (ES&H) programs at Fernald. As used in this report, Fernald, the Fernald site, and the Fernald Environmental Management Project (FEMP) refer to the Ohio Field Office (OH), the DOE Fernald Area Office (FN), and the contractors who perform work at the direction of FN and OH.

This evaluation was conducted as part of the Department's independent oversight program, which was consolidated in December 1994 under the Office of Environment, Safety and Health (EH) into the Office of the Deputy Assistant Secretary for Oversight. A major objective of the Office of Oversight is to provide the Secretary of Energy; DOE program, field, and contractor managers; the Assistant Secretary for Environment, Safety and Health; Congress; and the public with accurate and comprehensive information on and analysis of the effectiveness of the Department's ES&H programs.

The diverse materials at Fernald present a number of challenges to safety management.

The Fernald site was selected for review because the former site production process presents unique and diverse hazardous activities. Although Fernald no longer produces uranium metal, there is continued storage of over 16 million pounds of uranium-bearing materials once used there and at other DOE sites. In the past two years, Fernald has moved from the planning stage to actual

---

[1]Safety management refers to those m easures required to ensure that an acceptable level of safety is maintained throughout the life of a facility or installation. The term "safety" when used in the context of safety management or the safety management program specifically includes all aspects of an environment, safety, and health program.

[2]Line management refers to the unbroken chain of command that extends from the Secretary through the Under Secretary to the Cognizant Secretarial Officers, field organization managers, and contractors. Line management consists of DOE and contractor personnel organizationally or contractually responsible for work or job tasks, as well as effective safety.

decontamination and decommissioning activities, which involve unique and often challenging hazards. The large quantities of hazardous chemical and radioactive materials, construction activities, and pilot plant and demonstration project operations also present potential hazards to workers.

The EH approach to Oversight evaluations is presented in Section 2.0 of this report, which describes the Fernald site, the scope of the review, and the guiding principles for safety management that serve as the basis for the evaluation and the ratings. Section 3.0 presents the most significant evaluation results and Oversight's assessment of the effectiveness of the Fernald safety management program, organized according to the guiding principles of safety management. Conclusions and ratings are presented in Section 4.0.

Appendix A provides additional details on the evaluation approach and identifies the members of the Oversight evaluation team. It provides a detailed description of the evaluation criteria, methodology, and process. Appendix A contains the full text of the evaluation criteria, which serves as a template for an effective safety management program. It provides important detail for readers who are not already familiar with the guiding principles of safety management and associated criteria.

2.0 BASIS FOR EVALUATION

OVERVIEW OF THE FERNALD SITE

The Fernald site produced uranium metal.

The Fernald site was established shortly after World War II as the United States recognized a need for new facilities to produce uranium metal in support of defense activities. The site is located just north of Fernald, Ohio, 18 miles northwest of Cincinnati, Ohio, on 1,050 acres of Federal land. The former production area occupies 136 acres.

The government broke ground in May 1951, and produced the first uranium metal later that year. The major construction was completed by 1954. The site produced uranium metal components for almost 40 years. Figure 1 provides an overview of the former site processes and the facilities (locally referred to as plants) where various activities were performed.

Production has been suspended since 1989.

DOE suspended production in July 1989. In October 1990, DOE transferred management responsibility for the site from its Defense Programs organization to the Office of Environmental Restoration and Waste Management, now called the Office of Environmental Management (EM). In February 1991, DOE announced its intention to formally end the production mission and submitted a closure plan to Congress, which became effective in June 1991.

Figure 1.

The current mission is site cleanup and environmental restoration, which includes removing or dispositioning site nuclear materials, decommissioning and decontaminating site buildings and facilities, and returning some of the site to public use.

In addition to DOE, Federal, and state requirements, the Fernald site is governed by a Comprehensive Environmental Response, Compensation, and Liability Act Consent Agreement signed by DOE and the U.S. Environmental Protection Agency (EPA) in March 1990 and amended in September 1991. The Consent Agreement delineates commitments and schedules for environmental remediation activities at the Fernald Site. The Consent Agreement divided the Fernald site into five categories, which are referred to as Operable Units. Remediation approaches have been developed for the five Operable Units, which are shown along with the basic remediation approaches in Table 1.

Contractor activities at Fernald are managed by FN at the direction of OH, with programmatic direction provided EM. Figure 2 shows the DOE and contractor organizational elements that have the most significant roles in ES&H programs.

The Ohio Field Office (OH) provides direction to the Fernald Area Office (FN).

Figure 2

The current contract to operate Fernald was awarded in August 1992 to Fernald Environmental Restoration Management Corporation (FERMCO), a subsidiary of Fluor Daniel, Inc. The contract was structured by DOE as its first environmental restoration management contract rather than the more typical managing and operating arrangement. Concerns expressed by the Defense Nuclear Facilities Safety Board (DNFSB) later led to issuance of DNFSB Recommendation 93-4 regarding management and assessment of contractor performance under the environmental restoration contracting approach. FERMCO was created through a teaming relationship between Fluor Daniel, Inc., Halliburton NUS, Nuclear Fuels Services, and Jacobs Engineering. The contract runs through November 30, 1997, with a three-year option. The fiscal year 1995 budget for the contract was $271 million. Several subcontractors operate under the direction of FERMCO; one is performing decontamination and decommissioning activities at Plants 1 and 4 under a fixed-price subcontract. Approximately 2,076 contractor personnel were employed at Fernald in 1995.

The Fernald Environmental Restoration Management Corporation (FERMCO) operates the site at FN's direction.

The primary activities at the Fernald site include safe shutdown activities, decontamination and dismantlement of production facilities, environmental cleanup construction activities, and waste management:

Fernald site activities also focus on environmental restoration.

- Safe shutdown involves preparing facilities for dismantlement, including disposition of uranium products and residue materials; disposition of process equipment, supplies, and chemicals; and emptying, de-energizing, and isolating production-related equipment.

- Plant 7 was dismantled (including two major explosive demolitions to take down the structure) in 1994; it was the first of 125 major facilities scheduled for decontamination and dismantlement at FEMP. Current decontamination and dismantlement of production facilities is performed primarily under a fixed-price contract, and currently focuses on Plants 1 and 4.

- The largest ongoing construction at FEMP is construction of the vitrification pilot plant. This effort was scheduled to be finished in August 1995 and begin operations in 1996; however, de sign/construction problems have resulted in a 17-month delay in the schedule for the full scale remediation project.

- Ongoing activities require an extensive waste management program for legacy wastes, components that are being deactivated and decontaminated, and newly generated secondary wastes (e.g,. contaminated clothing). During fiscal year 1995 the Fernald site shipped 722,061 cubic feet of low-level radioactive waste to an offsite disposal site, 4,500 cubic feet of solid mixed waste to an EPA-approved disposal facility, 41,000 gallons of liquid mixed waste to EPA-approved disposal facilities, and 591,737 pounds of surplus uranium product materials to other users for non-defense-related purposes. Also in fiscal year 1995, Fernald neutralized and repackaged 200,000 gallons of uranyl nitrate and 6,000 gallons of thorium nitrate.

In addition to programmatic activities, FEMP has an extensive program for monitoring environmental quality on and near the site, including air, water, and soil. EH has an ongoing mentoring effort at FEMP that focuses primarily on the enhanced work planning demonstration.

Although production has ceased, the site has large quantities of hazardous materials.

Although the Fernald site no longer produces uranium metal, it continues to store nuclear materials once used there and at other DOE sites. The nearly 16,000,000 pounds of uranium, along with contaminated facilities, radioactive and mixed wastes, and thorium, are the site's principal radioactive hazards. The chemical hazards include acids, caustic materials, various industrial chemicals, and process wastes. The radioactive and hazardous materials of the most concern are listed in Table 2.

Table 2. Potentially Hazardous Materials at the Fernald Site

Uranium compounds and uranium metal[1] 0.5 million pounds of natural uranium (0.711 percent U-235) 8.7 million pounds of depleted uranium (less than 0.711 percent U-235) 6.8 million pounds of enriched uranium (up to 19.99 percent U-235)[2]
Magnesium fluoride contaminated with uranium
Pitchblende ore residues containing radium stored in Silos 1 and 2
Radioactive materials in the waste pits
Scrap metals contaminated with uranium compounds
Thorium and thorium compounds stored within the production area
Dilute hydrogen fluoride
Heavy metals
Hydrochloric acid
Laboratory chemicals
Nitric acid
Process waste
Sodium hydroxide
Sulfuric acid

[1] According to the May 1, 1996, inventory.

[2] Of the enriched uranium, 90 percent is less than 2 percent U-235.

The extensive construction, decontamination, and decommissioning activities ongoing at Fernald present hazards to workers that are challenging to characterize and predict. Ongoing process operations in demonstration facilities and work in areas with high voltage, heavy equipment, and rotating machinery also involve potentially hazardous conditions.

EVALUATION SCOPE

The evaluation focused on the following organizations responsible for safety management at the Fernald site:

The Office of Environmental Management, OH, FN, and contractors were reviewed.

- EM, the cognizant secretarial office at DOE Headquarters primarily responsible for program development and direction of the activities reviewed during the evaluation
- OH and FN, who are responsible for management and execution of DOE programs at the Fernald site
- The prime contractor, FERMCO, and various subcontractors, including the fixed-price subcontractor.

Implementation of safety management programs was evaluated at selected Fernald facilities/projects:

Selected Fernald facilities were reviewed.

- K-65 Silos vitrification pilot plant
- Building 64 and 65 overpacking project
- Safe shutdown of Plant 5
- Decontamination and decommissioning of Plant 1.

In addition, construction activities were evaluated across the site at various locations where construction, renovation, or disassembly activities were ongoing. Table 3 provides an overview of the work and associated hazards in these facilities/projects.

For each facility/project, the team conducted vertical reviews to determine the effectiveness of the safety management system in place. The vertical reviews examined selected functional areas: radiological protection, conduct of operations, waste management, construction safety, electrical safety, industrial safety/hygiene, maintenance, occupational health/medical surveillance, and quality assurance.

Vertical reviews of selected programs, functional areas, and systems were conducted.

The vertical reviews consisted of an examination of a functional area that includes a review of policies and management programs, as well as their implementation at selected facilities and process operations, including reviews of procedures, hardware, and knowledge and qualifications of personnel on the "shop floor."

Table 3

The Oversight team's review focused primarily on management systems that are designed to protect workers, the environment, and the public. The Oversight team focuses on ES&H and does not review financial and contractual issues, which are currently being reviewed by the General Accounting Office and/or the Inspector General.

The review covers a useful cross-section of the safety management program.

The results provide useful insight into the effectiveness of the overall safety management program at Fernald. Evaluation results should be viewed in the context of the scope of the evaluation and the sample of facilities and topics selected for review. Strengths and weaknesses identified during this evaluation may not be representative of all areas and contractors at Fernald. Nonetheless, since the facilities and projects selected for evaluation encompass a diverse cross-section of the site activities and ES&H programs, the Oversight team believes that the facilities selected for review represent a valid sample of overall Fernald ES&H program performance.

CONCEPTUAL BASIS FOR EVALUATION

The Office of Environment, Safety and Health has developed a conceptual framework for evaluations.

As a basis for Oversight evaluations of ES&H programs, EH has formulated a conceptual framework that characterizes the principles, programs, and disciplines that are essential elements of a sound safety management program. This approach to oversight is based on the fundamental premise that line managers are responsible for managing safety through proper work planning, hazards analysis, and hazard control. The adequacy of the systems, processes, and procedures managers use to assure environmental protection and worker health and safety are assessed against a set of clearly defined principles and accompanying criteria. This generic framework can accommodate the wide range of operations, hazards, and management styles at DOE facilities. At the same time, the framework serves as a template against which managers can assess the adequacy of current safety efforts and from which, over time, an understanding of site-specific trends and inter-site comparisons can be drawn.

The framework centers on three fundamental safety management principles and associated criteria.

The conceptual framework centers around three of the five fundamental management principles[3] identified by DOE in an October 1994 letter to the DNFSB. The letter included a comprehensive description of the functions that the Department deems necessary to fulfill its mandate under its enabling legislation to provide "reasonable assurance that the safety and health risk of operating personnel and the public be minimized."

---

[3]Five guiding principles are identified in the DOE's letter: line management responsibility for safety, comprehensive requirements, competence commensurate with responsibilities, independent oversight, and enforcement. The last two are performed by the Office of Oversight and other Departmental elements. The evaluation of the Fernald site, therefore, focused on Fernald's effectiveness in implementing the first three of the five guiding principles, which are directly applicable to line management.

The three applicable fundamental principles for an effective safety management program and the applicable evaluation criteria are shown in Table 4. These principles are discussed in more detail in Appendix A, which includes the full text of the criteria.

An overall view of the process for evaluating the effectiveness of the implementation of each guiding principle and the overall Fernald site safety management program is depicted in Figure 3.

Table 4. Guiding Principles and Criteria for Safety Management Evaluations

Principle	Criteria
#1 - Line managers are responsible and accountable for safety.	1-1: Clear Safety Policies and Goals 1-2: Defined Responsibilities and Authorities 1-3: Project and Resource Management 1-4: Line Management Accountability for Performance
#2 - Comprehensive requirements exist, are appropriate, and are executed.	2-1: Requirements Management 2-2: Hazards Analysis 2-3: Implementation of Requirements 2-4: Assessment Programs
#3 - Competence is commensurate with responsibilities.	3-1: Staffing and Qualifications 3-2: Technical Competence and Knowledge of Hazards 3-3: Worker Participation and Empowerment 3-4: Training Programs

EVALUATION RATING SYSTEM

The basis for the assigned ratings reflects the criteria identified in the template. These criteria are considered necessary to implement the Secretary's principles for establishing an effective safety management system, with the criteria in the template representing the Department's standard. The template represents an analytical framework designed to provide a professional approach to oversight that adds value to management decisions; it does not simply list examples of non-compliance with DOE requirements. The template was designed to promote the mature, professional judgment, reflecting the Secretary's principles, that will achieve Oversight's objectives.

Figure 3

The ratings for each of the guiding principles and the safety management program are graphically represented using a color rating scheme. The colors and their meanings are as follows:

The rating system uses colors as a visual summary of performance.

Red: Significant weakness
Yellow: Improvement needed
Green: Effective performance.

This color rating system is not intended to provide a relative rating between specific facilities or programs at different sites because of the many differences in missions, hazards, facility life cycles, and use of sampling techniques.

A "green" rating denotes "effective performance." This rating reflects effective implementation of the Department's standards for an effective safety management program (the template with its associated criteria). Although some deficiencies or issues may have been identified during an evaluation, a green rating is appropriate if those deficiencies or issues do not degrade the overall effectiveness of the program.

A "yellow" or "red" rating indicates that one or more of the Department's standards are not met and that improvement is needed, with a red rating indicating that the identified weaknesses are significant and require prompt attention.

3.0 RESULTS

This section summarizes the results of the Fernald safety management program review for each of the three guiding principles, as delineated in Section 2. Following the discussion of the three guiding principles, the overall effectiveness of the Fernald safety management program is discussed; the focus of this discussion is on how well the safety management program functions to achieve its ultimate objective of protecting workers, the public, and the environment.

Guiding Principle #1 - Line managers are responsible and accountable for safety.

FEMP is the first major DOE site to reach the stage of remediation where most remedial decisions have been made and approved by EPA and, in this case, the state of Ohio. FEMP is further along than other DOE sites in the decontamination and decommissioning process, and is performing decontamination and decommissioning work on a scale that has not been experienced by the DOE workforce. Consequently, FEMP is often in the position of "breaking new ground" for DOE.

In the 1992-93 timeframe, the DNFSB recognized that FEMP activities represented a new scope of work and involved a new type of contract. These concerns led to their issuance of Recommendation 93-4. In response, DOE developed the Technical Management Plan (TMP), which defines the responsibilities, requirements, and programs that DOE and its contractors must implement at the Fernald site.

Because both OH and FN have significant roles and responsibilities with respect to FEMP, the responsibilities are implemented somewhat differently than most DOE operations offices. Consistent with the TMP, the DOE Headquarters FEMP Program Branch (EM-42) within the Office of Environmental Restoration (EM-40) provides overall line management programmatic direction to FN through OH. The OH Manager has overall line management responsibility for FEMP and four other sites. The Area Offices Directors under OH, of which the FN Director is one, report to the OH Manager. Although geographically separate from OH, the Area Offices act as operational divisions of OH. The Area Office Director function is conceptually similar to the Assistant Manager function common at DOE operations offices.

Departmental responsibilities are implemented at Fernald somewhat differently than at most operations offices.

The OH Manager has delegated responsibilities for day-to-day management and most oversight functions to FN, while OH performs most of the corporate functions such as human resources, legal, and procurement. The OH Manager has retained certain approval authority, such as approval for authorization basis documentation for OH sites. OH provides program management support and resource assistance to FN. OH is also responsible for establishing overall policies for OH and Area Office operations. The OH Office of Compliance and Support provides ES&H technical support (participation on assessments, operational readiness reviews, etc.), as requested by the OH Area Offices. The OH Office of Compliance and Support also serves as advisor to the Manager on ES&H issues, including a review and recommendation function on approval authorities held by the Manager. OH also acts as a focal point for coordinating new initiatives, rules, DOE orders, and Federal and state regulations.

In general, OH interacts with contractors through the Area Office (FN in the case of FERMCO). FN has the primary role in interfacing with FERMCO and regulators. FN also interfaces with DOE Headquarters for ES&H and line program concerns. OH provides support as necessary.

Criterion 1-1 - Clear Policies and Goals

The flowdown of ES&H policy and goals from EM through OH to FEMP is effective. EM-1, EM-42, and OH have established progressively more specific goals for FEMP. These goals appropriately reflect the priority of safety programs. The OH ten-year strategic plan's overall objective is to achieve an environmentally restored end state for all its sites within a decade; the plan establishes key success factors, strategies, and performance measures associated with accomplishing this objective.

There is a clear flowdown of Department goals to the contractor.

While ES&H goals have been well established and communicated for the site, definition of specific ES&H goals at the project and/or lower levels of the contractor organization is less clear in a few cases. For example, flowdown of specific ES&H goals for the Remediation Support Operations Division was found lacking at the division, department, section, and individual levels.

Ensuring a safe workplace that is free from fatalities and that continuously reduces injuries and adverse health effects is critical to the success of accomplishing the OH mission. Key success factors and associated objectives in ensuring a safety management system are established and maintained. These include providing a clear representation of the safety culture at the OH sites, enhancing safety through work planning, and improving safety monitoring. OH has developed and issued policies on safety management, ES&H, and waste management; however, pollution prevention/waste minimization requirements and goals are not clearly defined within the waste management policy. In addition, FN and FERMCO have not placed sufficient emphasis on as-low-as-reasonably-achievable (ALARA) policy at the programmatic level.

Safety goals specific to FEMP are also established in the FEMP strategic plan, which was prepared by FN in partnership with FERMCO. The goals in the FEMP strategic plan are consistent with and linked to the OH overall mission, goals, and objectives. Like the OH strategic plan, the FEMP strategic plan delineates specific approaches, action steps, and performance measures to implement safety goals. These include demonstrating management commitment to the Safety First initiative objectives and support efforts to change the safety culture at Fernald; involving employees in the development and implementation of a safety culture where managers, supervisors, and labor take ownership of and responsibility for the Fernald safety program; and establishing communication channels that are utilized by all employees to identify safety issues, share solutions, and support the safety culture of Fernald. The goals specified in the FEMP strategic plan are linked to the FERMCO cost performance-based fee plan. The FERMCO Policies and Requirements Manual translates these goals into FERMCO policies.

FN and the contractor have developed a strong partnership to establish safety policy.

Partnership between FN and FERMCO in establishing safety policy is very strong, especially in communicating a uniform message and presence to the site workforce on establishing and maintaining a safety ethic through the Safety First initiative. In January 1994, FN and FERMCO initiated the Safety First initiative to improve the safety culture at Fernald by creating an atmosphere that encourages employees at all levels of the organization to "take ownership" of safety. Management and worker support for this initiative is clearly evident and is effective in involving employees in the safety process and empowering them to take ownership of conditions in their workplaces. However, worker involvement in the enhanced work planning initiative is not at the planned level, as discussed later under Criterion 3-3.

Other significant initiatives include the worker's "Bill of Rights," which delineates personal safety principles and rights; the "Green is Clean" initiative; and participation in the voluntary protection program. FN and FERMCO senior management support for these efforts is clearly evident.

Senior management is committed to establishing and ensuring a strong safety culture.

FN and contractor senior management involvement and commitment in establishing and ensuring effective ES&H policy are strong. For example, senior management has established a presence in the field by FN senior

management walk-throughs, the FERMCO senior manager's safety tours program, and the President's Safety Committee, which is active and visible in promoting safety.

Clear safety policy is communicated and reinforced to the workers and supervisors continually through various meetings and written communications. The protocol for most meetings, regardless of purpose, is to begin with a short session covering and communicating a safety message. As discussed under Criterion 2-4, however, there are some instances, such as FN's compliance assessment program and FERMCO's maintenance program, where policies are not being adequately followed.

One of EM's strategic goals is to develop strong partnerships between DOE and its stakeholders. FN's and FERMCO'S efforts to keep the community, public officials, and regulators apprised of activities at FEMP have paid off over the past few months, and support from external stakeholders has remained high. Further, the Envoy Program, established in 1995, is designed to have FERMCO employees act as representatives to "opinion leaders" and take advantage of existing relationships between Fernald employees and external opinion groups; for example, the FEMP fire chief acts as envoy to fire chiefs and other emergency management people in the surrounding communities.

Overall, OH, FN, and FERMCO have established clear safety policies and goals. A few areas require strengthening: the establishment of clear definition and flowdown of contractor ES&H goals on the project, organizational, and individual level; the establishment of clear pollution prevention/waste minimization requirements and goals at OH; and continued policy emphasis by FN and the contractor on occupational and environmental ALARA goals and objectives. Such initiatives as Safety First and efforts to increase and maintain worker and community involvement (e.g., the Envoy Program) are helping to achieve a safety-conscious culture at the Fernald site.

Overall, safety policies and goals are understood and accepted.

Criterion 1-2 - Roles and Responsibilities

The Fernald TMP is the primary source document for delineation of roles, responsibilities, and tasks for DOE's technical management of FEMP. The tailored requirements in the TMP provide the framework for delineating management responsibilities and qualifications of DOE personnel at FEMP. Although the TMP addresses FEMP-related responsibilities of EM-40, it does not similarly address the roles and responsibilities of OH.

The Technical Management Plan is the basis for defining roles, responsibilities, and tasks for FN.

Clear definition, effective communication, and sound understanding of the roles and responsibilities for ES&H at OH require strengthening. OH organizational roles and responsibilities were generally understood by senior managers in OH and FN offices; however, they were neither well documented or understood at the staff levels nor clearly addressed in policies and procedures.

OH roles and responsibilities are not well understood.

OH has not exercised its authority for review and approval of authorization basis documents.

OH has not properly exercised its authority for review and approval of authorization basis documents. FERMCO submitted a DOE Order 5480.22/5480.23 Implementation Plan and Basis of Interim Operations (BIO) package to FN on December 27, 1995. FN and FERMCO indicated that these documents have been effective since January 8, 1996. FN submitted the package to OH on April 9, 1996. Although FN recommended approval, at the time of this evaluation OH had neither acted upon nor approved these documents, nor has OH delegated approval authority for the BIO to FN. No clear recognition of the unapproved and still pending status was given by OH. As a result, FERMCO, with FN concurrence, is operating according to authorization bases that are not approved by DOE. However, FN, OH, and FERMCO did not recognize the importance of conducting rigorous reviews leading to formal approval before a safety analysis is used as the basis for operations. Without such reviews, the potential for errors is higher. As discussed under Criterion 2-2, there were a number of errors in the unapproved safety analyses.

As discussed under Criterion 2-1, OH is not functioning in the role it defined for itself with regard to the control and distribution of DOE orders. A formal process to communicate implementing policy for DOE requirements to OH and its Area Office staffs, such as that recommended in a recent assessment of another OH Area Office, may help to clarify the many misunderstandings that now exist with regard to the distribution of orders and directives and to ensure consistent direction to all OH Area Office Directors. Also, OH personnel who provide technical assistance to FEMP may also participate in assessments or provide independent review of documentation. There are no mechanisms for maintaining an appropriate degree of objectivity, such as assuring that personnel do not review their own work during independent assessments or reviews.

OH has not exercised its responsibility related to control and distribution of requirements.

While ES&H roles and responsibilities are more clearly defined at FN through the TMP, management did not adequately establish or communicate its expectations to staff with respect to implementation of the TMP. Team leaders and staff personnel who were assigned as subject matter experts often did not understand what parts of the TMP's compliance assurance plan they were responsible for, what tasks were required, or how the tasks were to be accomplished. In some cases, FN did not adequately communicate expectations to staff on execution of the assessments, development of schedules to support the assessment activities, and tracking and trending of the progress and results of the assessments. Further, most personnel job descriptions and performance plans within FN are generic in nature, and detailed TMP implementation plans and procedures did not exist to define the necessary actions to meet the intent of the TMP.

FN management expectations for implementation of the Technical Management Plan have not been communicated.

Senior FN management has, however, formally communicated expectations regarding line managers' responsibility and accountability for safety, and additional training has been provided to project managers in regard to their responsibility for safety. Management has also taken action to more clearly define the responsibilities of Facility Representatives, although no formal direction has been specified on limitations of responsibilities for Facility Representatives who are not yet fully certified. This gap has some significance since only one of six Facility Representatives has been fully certified to date.

The FN line managers' responsibility for safety has been well communicated.

ES&H roles and responsibilities for FERMCO were generally better defined, documented, and understood. The FERMCO Management Plan, which communicates FERMCO ES&H policy, also delineates ES&H roles and responsibilities for its organizations, managers, and workforce.

The contractor's roles and responsibilities are generally well defined, documented, and understood.

For new subcontracts, FERMCO conducts prebid meetings to set forth FERMCO's expectations for ES&H performance. This practice ensures that subcontractors have full understanding of their roles and responsibilities before presenting their bids.

ES&H roles and responsibilities for activities conducted by FERMCO as part of the safe shutdown program were clearly defined, effectively communicated, and understood. However, within the Remediation Support Operations Division, the roles and responsibilities for the various maintenance functions are not clearly communicated or understood. Repeated reorganizations and extensive matrixing of maintenance personnel have contributed to fragmenting the maintenance program functions among at least five departments. In most cases, documentation (e.g., plans and procedures) was not modified in a timely manner to reflect changes in maintenance functions and responsibilities. The recent Resource Conservation and Recovery Act (RCRA) inspection deficiencies identified by FERMCO and cited by the Ohio EPA regarding missing inspection records were caused, in part, by a reorganization within the Environmental Compliance Division, which reduced the frequency of their inspection record verifications. Greater emphasis needs to be placed on managing organizational transitions to ensure that responsibilities for implementing ES&H requirements are not omitted.

A few other areas were identified where contractors' individual roles and responsibilities were not clearly understood. For example, FERMCO management's perception of the role of industrial safety and industrial hygiene professionals as providing oversight of the fixed-price subcontractor safety programs and establishing the envelope of safety activities for the fixed-price subcontractor implementation is inconsistent with field practice, in which safety professionals work together as an integral unit with little distinction between the roles and responsibilities of FERMCO and the fixed-price subcontractor.

While DOE and contractor personnel generally understand and accept their assigned responsibilities, improvements are needed in establishing clear communication of OH's role and authorities for its operations and clear expectations and tasks necessary to achieve effective buy-in and successful implementation of the FN TMP as it relates to compliance assurance activities. Further, increased management oversight by FN and FERMCO is needed to ensure clarity and retention of roles and responsibilities through the contractor's re-engineering efforts, in light of past problems resulting from organizational restructuring.

Definition of roles and responsibilities for OH and FN needs improvement.

Criterion 1-3 - Project and Resource Management

FN and the contractor have adequately applied Environmental

OH, FN, and FERMCO have adequately applied the EM risk-based approach to the prioritization of projects and budget development. Risk information is generated via risk data sheets, which capture various activities and evaluate the risk before, during, and after completion of the activity. Activities are then prioritized according to overall risk reduction, regulatory compliance, cost effectiveness/ mortgage reduction, and stakeholder concerns.

Management's risk-based approach to prioritization.

Recent FEMP planning activities have focused on implementing an alternate expedited ten-year remediation schedule, which is intended to reduce risk to the public. Management's planning focus has been on completion of those critical path steps essential to accomplishment of that goal. Due to the strong emphasis on cost and schedule for this risk reduction mission, items not directly identifiable in the critical path, such as maintenance activities, are being assigned a low priority and given minimal funding. Deferral of these items may have a negative synergistic impact on site safety and infrastructure and, therefore, on the ten-year baseline.

Planning activities have focused on an expedited remediation schedule to reduce risk to the public.

Consideration of hazards and ES&H requirements in project planning and budgeting is generally effective for large projects. However, some deficiencies were noted in lower-tier planning to support these projects. For example, one project plan does not specifically reference any waste management requirements, nor does it ensure that all requirements identified by the sitewide standards/requirements identification document are included in the plan.

Work activity planning through the enhanced work planning program has been shown to be successful in integrating review of safety professionals and has improved thoroughness, scheduling, and cost. According to FERMCO, the results of Remediation Support Operations Division's enhanced work planning demonstration project indicate that the projects are completed faster, the total billed to the project is reduced, and the project estimates are much closer to final costs. However, a review of completed work packages and interviews with the FEMP workers indicated minimal worker involvement in the planning process prior to the supervisor's pre-job briefing; as discussed under Criterion 3-3, incorporation of worker input is one of the major tenets of the enhanced work planning process.

The enhanced work planning demonstration project has yielded improvements.

Two sitewide information management systems, in use and being developed, have greatly improved control over worker training and health monitoring, raising overall worker safety. The FEMP site access system links training and medical surveillance records and precludes entry to controlled areas by personnel who are not current on training and medical surveillance. The relational data base planned for the enhanced work planning program is designed to identify workers, their work locations, their exposure assessment data, and their duration at a work site. This integrated information can target exposure assessment results, help target individual exposure information, and compare exposures to homogenous exposure groups (e.g., pipe fitters, sheet metal workers).

Information management systems have impacted worker safety in a positive manner.

Other tracking programs, which are maintained by various FN and FERMCO groups, are used to maintain information about various deficiencies, commitments, work orders, and similar data. Both the

Environmental Compliance Division and the Waste Programs Division maintain corrective action tracking systems. The suspect/counterfeit bolts program activity status reports allow engineering functions to monitor the presence of suspect bolts/items and the justification for removal. However, as discussed under Criterion 2-4, the information available through these systems is not being used effectively to assure that corrective actions are performed.

Consideration of environment, safety, and health requirements in project planning is generally effective.

Consideration of risk and ES&H requirements in overall project planning and budgeting is generally effective, and improvements in the sitewide data base systems, such as the site access system, have been effective in improving worker safety. Further, the enhanced work planning demonstration project initiative has been successful in integrating reviews by safety professionals. Additional improvements can be realized in the evaluation of ES&H risks through better use of the existing information systems.

Criterion 1-4 - Accountability

Accountability for Departmental organizations is well defined.

Organizational Accountability For ES&H Performance. EM-40 holds OH accountable for performance of the Area Offices against the six points of EM's Strategic Plan, the "Critical Few," and the Secretary of Energy's three Departmental principles. EM-40 also holds FN and OH accountable for performance against FEMP project goals. In addition, OH is formalizing organizational accountability mechanisms through its Strategic Plan. This increased emphasis on accountability of DOE managers for ES&H performance through well defined, objective measures is a significant enhancement that has gained momentum in the past year.

FN and FERMCO are also held accountable to stakeholders for ES&H performance in various forums made up of workers, the community, and regulators. The success of the FEMP public affairs program is evident in the results of the 1994 community assessment and the continued support of the community despite recent adverse media attention.

The performance-based fee determination plan is effective in refocusing contractor priorities.

The performance-based fee is one of the primary methods for applying sanctions and rewards for FERMCO's performance. The performance-based fee determination plan (fee plan), used as the basis for evaluating FERMCO's performance, is flexible and effective. Eighty percent of the fee pool is performance-based. In the April to September 1996 performance period, 24 percent of the fee pool is related to safe cleanup performance objectives and criteria, and 14 percent to waste management; additional ES&H performance measures are imbedded in other project performance objectives and criteria. The use of positive and negative incentives puts the contractor at financial risk. In the latest report of the FN Performance Evaluation Committee (covering April to September 1995), a portion of the fee was withheld in two categories: "reducing radiological occurrences" and "subjective evaluation of all FERMCO safety and health programs."

The fee plan performance objectives and criteria are negotiated every six months and, as a result, the plan is effective in refocusing FERMCO priorities and promoting timely and effective improvements in ES&H

programs. For example, the ALARA objective in the current fee plan was added to focus attention on ALARA deficiencies after FN identified problems with contamination control in 1995. This is a good example of effectively enhancing ES&H by linking goals to performance and using operational experience to refine those goals.

It is important that FN continue to improve its application of goals and award fees to improve performance. Some areas of weakness in ES&H management systems have not been addressed in the last two fee plans. FN has not held FERMCO accountable for continuing and repetitive inadequate corrective actions to maintenance and electrical safety deficiencies identified during FN assessments, nor has FN insisted that FERMCO finalize and issue its draft Maintenance Implementation Plan, which has been required by DOE Order 4330.4B since February 1994. In addition, there appear to be instances where safety-related actions, such as replacement of suspect/counterfeit parts, have been delayed significantly by a diversion of resources to higher programmatic priorities or to critical-path items that could affect milestones and thus could affect the FERMCO award fee.

Contractor organizations are accountable to the president of the contractor organization.

Within FERMCO, organizations are held accountable to the FERMCO president. ES&H statistics are reported to the President's Safety Committee. Managers are required to present the reasons for any deviations from planned levels of performance, along with a set of corrective actions. FERMCO is also held accountable to employees for ES&H performance through a safety culture survey administered with the annual general employee training. The results of this survey have been positive and measure the respondents' active involvement in safety, the perceived support by other employees of FEMP in dealing with safety issues, and the level of interest in safety. This is viewed as an indicator of the effectiveness of management's responsiveness to safety issues.

Through their contracts, subcontractors are held accountable for performance.

FERMCO holds subcontractors accountable for safety performance by performance indicators, such as recordable injuries and the manhours worked without a lost time accident, in their contracts. The fixed fee contract for decontamination and decommissioning of Plant 1 has no provisions for award fees. However, the fixed-price subcontractor can be ordered to stop work for non-conformance to the ES&H terms of the contract until approved corrective actions have been implemented. FERMCO has exercised this contract term for short periods of time, but there have been no work stoppages that resulted in all workers leaving the area. In effect, a work stoppage is an effective sanction on a fixed-price contract because there would not generally be a time extension or additional compensation for the work stoppage.

Incentive programs for subcontractors operating under cost-plus contracts are effective in holding these subcontractors accountable for occupational safety (e.g., recordable injuries, lost work days). For example, 33 percent of one construction subcontractor's profit is at risk during each billing period. On some occasions, FERMCO has withheld a portion of the fee because of ES&H issues. It does not appear that there are similar incentives for environmental performance (such as waste minimization and pollution prevention).

Mechanisms for holding individuals accountable need strengthening.

Individual Accountability for ES&H Performance. For DOE managers, individual ES&H performance accountability is defined in the performance appraisal plan. ES&H performance standards are the same for all levels of

management. The standards are subjective in nature, and ratings are tied to quality of work.

Interviews with FERMCO and teaming partner management and staff indicate their clear understanding that line personnel are accountable for safety and that their responsibilities are defined in sitewide documents and program documents. One exception is the Remediation Support Operations Division Maintenance Department, where some personnel interviewed were not clearly knowledgeable of the sitewide policy. The performance plans for all salaried FERMCO personnel include a "pass/fail" assessment of their safety consciousness and environmental compliance. Failure in either of these categories is grounds for dismissal. In one recent case, a FERMCO salaried employee was dismissed for poor safety performance.

Instances were identified where FN and FERMCO managers and staff were not held accountable for implementation of programs or program elements. For example:

- FN subject matter experts have not been held accountable for non-compliance with the TMP compliance assurance plan.
- Performance appraisal plans for managers and staff in FN organizations (other than the Safety and Health organization) with responsibility for implementing sections of the TMP do not contain explicit performance standards with respect to that responsibility.
- Based on interviews and a limited review of individual performance plans for FERMCO personnel, ES&H performance indicators were not consistently reflected in individuals' performance plans.
- There is no documentation of individual-specific safety performance goals or expectations for FERMCO senior managers.
- As evident in a weak corrective action program, maintenance managers are not being held accountable for ES&H performance.

Performance indicators are generally used effectively to improve environment, safety, and health performance.

Performance Indicators. There are multiple performance indicators and performance measurement systems in use at the site. Some indicators, such as the safety culture survey and the community assessment, are subjective in nature, but actions are taken to address issues that arise. For example, the FEMP Community Relations Plan, which includes environmental protection performance indicators, was revised in response to the 1994 community assessment.

Some sitewide performance indicators are tracked as part of the performance-based fee determination process, such as radiological contaminations, ALARA program improvements, and waste shipments. Members of the FN Performance Evaluation Committee meet frequently with their FERMCO counterparts to discuss progress against the performance measures described in the fee plan.

Performance indicators and measures are used extensively both site wide and in individual programs, projects, and work groups to supplement those considered in the fee award process. For example, FERMCO tracks performance indicators in ten ES&H categories and presents them monthly to the President's Safety Committee. These are used to hold the program and project managers accountable.

Overall, line management is effectively held accountable for environment, safety, and health performance.

Overall, line management is effectively held accountable for ES&H performance. Objective, quantitative performance measures and indicators are widely used at FEMP to assess ES&H performance. FERMCO and its subcontractors are also held accountable for ES&H through contract mechanisms that put them at financial risk. The fee plan has been used effectively to refocus FERMCO priorities and promote improvement in ES&H programs. However, the formal mechanisms to hold individuals accountable need improvement, and additional attention is needed to ensure that the award fee plan consistently provides incentives to sustain or improve ES&H performance.

Overall Evaluation of Principle #1

EM, OH, FN, and FERMCO have demonstrated support for safety as the site continues its transition to environmental restoration activities. The impetus provided by the development of the TMP has led to improvements in the FEMP safety management program. Management initiatives, such as Safety First, are helping to achieve a strong safety culture at FEMP. FEMP has effectively implemented three of the four criteria associated with this guiding principle, although additional attention is needed to assure individual accountability for ES&H performance. Improvement is needed in defining roles and responsibilities, particularly with regard to OH and the responsibilities for implementing all requirements defined in the TMP. Although some deficiencies are evident, on balance FN and FERMCO management understand and have embraced line management responsibility for safety.

Guiding Principle #2 - Comprehensive requirements exist, ar e appropriate, and are executed.

FEMP has faced significant challenges associated with being among the first sites to transition exclusively to an environmental remediation mission; it is governed by conditions imposed by the EPA (the Amended Consent Agreement implementing Comprehensive Environmental Response and Compensation Liability Act) and the Ohio EPA (the Directors Final Findings and Orders implementing RCRA), as well as DOE orders and other Federal and state requirements. Also, because many DOE orders were developed primarily for operational facilities, applying them to FEMP, which is in the later stages of its life cycle, has not always been straightforward.

Fernald is among the first sites to transition exclusively to an environmental remediation mission.

The different technical challenges posed by cleanup, decontamination, and decommissioning work and the new contract structure were the primary factors leading to DNFSB Recommendation 93-4, and the resulting development of the TMP for FEMP. The TMP was issued in July 1994 and approved by EM in June 1995. The TMP has evolved to be more than a traditional "plan"; it is the document that serves as the sitewide standards/requirements identification document (S/RID) for FN and defines requirements for FN responsibilities such as compliance assessments.

Criterion 2-1 - Requirements Management

S/RIDs are the basis for the FEMP requirements management system. The DOE sitewide S/RID, embedded in the TMP, defines requirements for FN and to some extent EM. The FERMCO Management Plan, Policies and Requirements Manual functions as a sitewide S/RID that defines the requirements that apply to FERMCO. The FERMCO S/RID was approved in June 1995. The next revision of the S/RID is slated to be incorporated into the FERMCO contract by reference.

Requirements are defined in the site Technical Management Plan and the FERMCO Management Plan as sitewide standard/ requirements identification documents.

The FN requirements management system is conceptually sound. The FN TMP (including the S/RID, which is an integral part of the TMP) captures DOE requirements, regulations, consensus standards, State and local statutory and regulatory requirements, and binding agreements. These requirements and regulations were tailored to FEMP by eliminating those requirements that did not apply and by adding selected site-specific requirements. These requirements were segregated into 20 functional areas, which provide a logical grouping of responsibilities and allow for future consideration of modifications to statutory and regulatory requirements.

The FN requirements management system is conceptually sound.

Development, approval, and implementation of the S/RID process requires two phases of assessments of the S/RID. The Phase 1 assessment is designed to verify that the appropriate requirements are identified. The Phase 2 assessment is designed to verify that requirements are effectively implemented. FN completed the Phase 1 assessment effectively. A meaningful Phase 2 assessment of the FN S/RID has not been performed (see discussion under Criterion 2-4).

FN has not performed a meaningful assessment of its standards/requirements identification document.

The FERMCO requirements management system is functioning effectively. FERMCO has defined an effective document hierarchy for ranking documents by their authority and requirements level. In this hierarchy, the approved S/RID establishes the sitewide requirements from which policies, internal requirements, plans, procedures, and instructions are developed. The system of preparation, review, approval, issuance, use, and revision for documents provides for controlled documents at the site and division levels. The requirements management system includes a process to archive previous requirements when new versions of the S/RIDs are produced.

FERMCO requirements management is effective.

Phase 1 and Phase 2 assessments of the FERMCO S/RID have been virtually completed; a few deficiencies were identified with certain aspects of the assessment process. For example, the S/RID for the maintenance functional area did not sufficiently specify some individual requirements, and the Phase 1 S/RID assessment did not discover that all requirements from the DOE order on maintenance (DOE Order 4330.4B) were not adequately addressed.

FERMCO identifies new and changing external requirements using a variety of state and Federal data bases and through contact with the EH Office of Environment. This function is performed by designated experts and assigned individuals; however, the process is not documented in procedures, and formal assignment of responsibilities for functional areas (e.g., waste characterization) was not found. One instance was noted where an external requirement was not adequately identified and implemented. The RCRA inspection program does not itemize required emergency equipment for each unit, nor does it specifically include all weekly inspection requirements for the Plant 1 Pad.

OH policy specifies that OH serves as the focal point for receipt and further distribution of DOE orders. However, the directives function at OH is limited to a distribution function that is managed by a single clerk who handles directives and other records on a part-time basis. In practice, FN receives its orders directly from DOE Headquarters, and it forwards them to the OH contracting officer for transmittal to FERMCO. Although OH is not functioning in the role it has designated for itself, as discussed in Criterion 1-2, FN is generally operating effectively to accomplish this function.

OH is the specified focal point for Department orders. In practice, FN receives its orders directly from Headquarters.

FERMCO establishes ES&H requirements for a variety of large and small subcontractors through General Provisions and Special Terms and Conditions. The flowdown process is well structured and integrated.

The flowdown of requirements to subcontractors is well structured and integrated.

Both FN and FERMCO have effectively implemented a comprehensive requirements management system for internal and external requirements. The FN and FERMCO requirements management system is conceptually sound, generally effectively administered, and effective in specifying responsibilities for implementation. There were only a few instances where requirements were not adequately identified and communicated. The vast majority of the multitude of external and internal requirements were adequately identified and translated into appropriate activities.

The requirements management system at Fernald is effectively implemented.

Criterion 2-2 - Hazards Analysis

Both FN and FERMCO have been aggressive in their efforts to enhance authorization basis activities at the Fernald site. Overall, the status of safety analyses for FERMCO is positive for both operational and post-operational facilities. The status of FEMP authorization basis documents is summarized in Table 5.

All FERMCO operating facilities have approved safety analysis reports (SARs). The SAR and technical safety requirements for the thorium overpacking project are approved. The safety analysis prepared for activities at the Thorium Warehouse (a Hazard Category 3 facility) are based on a graded approach, are adequate, and generally meet the intent of DOE Order 5480.23. The safety evaluation reports, preliminary SAR, Operational Safety Guidance Manual, and HAZOP for the Vitrification Pilot Plant non-radioactive operations are also approved and provide an adequate hazard analysis for activities planned for this pilot project. The Final SAR for the Vitrification Pilot Plant is in development and will be in place prior to beginning radioactive operations.

The thorium overpacking project and the Vitrification Pilot Plant have approved safety analysis reports.

In addition, a DOE Order 5480.22/5480.23 Implementation Plan (IP) was recently submitted to DOE for approval; this Plan contains the Basis of Interim Operations (IP/BIOs) for 12 non-operational facilities, some of which are currently undergoing safe shutdown. Because of the short duration of these activities, it is appropriate to capture the safety analysis results using the BIO approach. In the near term (two to three years), FERMCO will complete safe shutdown to reduce nuclear material inventories and to place the buildings in a safe configuration pending ultimate decommissioning. The Implementation Plan that was submitted to DOE for approval includes 12 IP/BIOs, three safety documents (criticality, material handing and storage, and safe shutdown), and ten safety program summaries. As discussed under Criterion 1-2, FERMCO has considered this Implementation

An Implementation Plan containing basis of interim operations was submitted to OH for all other nuclear facilities at Fernald. Approval is still pending.

Table 5

Plan effective since January 8, 1996. FN has endorsed the use of these IP/BIOs and has recommended that OH approve them; approval is still pending.

The team's review of the Implementation Plan noted several deficiencies:

The team's review of the Implementation Plan noted several deficiencies.

- Discrepancies between a statement indicating that certain components had no safety significance and later statements that those components mitigate potential hazards associated with criticality and pyrophorics
- Inappropriate credit taken for hazard identification activities that are no longer being performed (e.g., facility safety assessment program activities for Plant 5)
- Implementation documents that do not adequately describe or capture all essential pertinent elements of the maintenance program
- BIO and safety documentation that adequately describe risks for the existing waste inventory (Plant 1) but do not consider the risks of decontamination and decommissioning on the drum inventory, in particular those located in the shed
- Some lack of clarity on the interrelationship of the documents in the Implementation Plan, leading to some confusion among OH, FN, and FERMCO as to how the various documents collectively contribute to the authorization basis for each plant.

These deficiencies point to weaknesses in review and approval processes within FERMCO (Independent Safety Review Committee) and OH. While work is being undertaken in many of the facilities covered by the IP/BIO, it is important to note that there were no prior approved safety analyses for these post-operational facilities. The progress made on the IP/BIO is a significant improvement.

These deficiencies point to weaknesses in the review and approval process.

FN and FERMCO have been aggressive in their effort to control authorization basis for operation and post-operational activities. The recently issued FERMCO authorization control plan needs to be more carefully reviewed to assure that the documents identified in the plan represent the current approved authorization basis. The appropriateness of issuing this document at this time is questionable because the IP/BIO documents have not yet been approved. FN, with assistance from OH, recently conducted an assessment of the unreviewed safety question determination process. The assessment methodology used was effective, and the findings of this assessment, when acted upon by FERMCO, should further strengthen and improve the FERMCO program.

FN's review of the unreviewed safety question determination process was effective.

Hazards analyses have been performed effectively. The hierarchy of hazards analysis begins with the sitewide analysis and flows down to project-specific and task-specific analyses. The hazard analyses are important parts of defining on-the-job safety activities. For example, the hazard evaluations related to individual maintenance work activities

Hazards analyses have been performed effectively.

included in the enhanced work planning process are effective. Similarly, the waste characterization organization prepares sampling plans for waste containers; these plans consider job hazards and propose mitigation for hazards.

Overall, the FEMP hazards analysis process is effective. The safety analyses have been developed and approved for all operational facilities at FEMP and have been submitted for the non-operational facilities. Although some problems were noted, the analyses are generally complete and appropriately consider hazards. The problems with the approval process are a roles and responsibility issue primarily with OH, as described in Criterion 1-2. The hazard analysis activities performed at the project and task levels are well structured and effective in improving safety.

The hazard analysis activities performed at the project and task levels are well structured.

Criterion 2-3 - Implementation of Requirements

Most Fernald implementing programs are fundamentally sound, and procedures are consistent with DOE orders and Federal, state, and local requirements. Requirements are generally well defined in sitewide documents. Table 6 provides an overview of the positive attributes and areas requiring improvement in each of the ten implementing programs reviewed. Based on the data gathered during this evaluation, most programs, including radiological protection, conduct of operations, industrial safety/industrial hygiene, waste management, construction safety, occupational health/medical surveillance, quality assurance, and criticality safety, were generally effective, although some deficiencies were identified in each of these programs.

In general, functions directly tied to ES&H, such as radiation control and industrial hygiene, are being effectively implemented. However, there are significant and pervasive problems with maintenance, and electrical safety requires improvement. Many of the problems noted in electrical safety are related to the problems in maintenance (e.g., problems involved inadequate maintenance of electrical components and inadequate procedures for performing maintenance on electrical substations). Adverse consequences may result from deferred or inadequate maintenance, inadequate calibration, inadequate inspection or testing, and non-adherence to work planning and safety and health documents. However, the vulnerability associated with these problems

In general, functions directly tied to environment, safety, and health are being effectively implemented.

There are significant and pervasive problems with maintenance, and electrical safety requires improvement.

Table 6

Table 6 cont

is mitigated by the lessened reliance on safety systems and components, based on the current site mission and facility life-cycle status. Figure 4 summarizes some of the concerns noted in maintenance.

FERMCO procedures are generally well structured.

FERMCO procedures are generally well structured and are effective in communicating requirements and expectations to the working level staff. For example, requirements for radiological control are well defined in Department and sitewide procedure manuals. Further, each group within radiological control (e.g., dosimetry) has well documented and developed procedures and technical basis reports. However, isolated weaknesses remain in document change control and procedure adherence in other areas, such as maintenance.

Electrical safety and maintenance procedures and instructions are ineffective.

Although procedures for most implementing programs were adequate, electrical safety and maintenance procedures and instructions are notable exceptions. The Maintenance Implementation Plan has not yet been approved, although there has been a requirement for a plan since February 1994. Many maintenance procedures are out of date. Procedure change controls need improvement. Past self-assessments in the Remediation Support Operations Division have identified numerous document control deficiencies at many document issue stations. During the assessment, improper use of Temporary Change Notices (i.e., original pages left in the procedure, with no annotation that these pages had been superseded) created some operator confusion when an electrical lineup procedure was used at the Vitrification Pilot Plant. Such implementation errors can lead to unsafe conditions.

Indications of continuing procedural non-adherence were found in a few areas. According to one recent FEMP Quarterly Status Report, "Personnel error resulting from a violation of requirements or procedures" was the most frequently identified cause for non-conformance. The Oversight team also identified a number of instances where procedures were not followed or were not adequately implemented. For example, RCRA inspection deficiencies were found relating to loading and unloading areas, specific emergency equipment, date and nature of corrective actions not noted on sheets, accumulated liquids in trenches not recorded, broken concrete berm not recorded, cracks in pad expansion joint seals not recorded, bulging drums not recorded. In addition, FERMCO personnel failed to follow the safe shutdown energy isolation procedure. While the failure to follow the procedure did not have a direct safety significance in this instance, supervisors and management were aware that the steps were not being performed in accordance with the procedure for over one year but had not taken action.

Most implementing programs at Fernald are effectively implemented and performed in compliance with requirements.

Overall, most FEMP implementing programs are well conceived, effectively implemented, and performed in compliance with requirements. The deficiencies are primarily concentrated in one area

Description of Maintenance Program Concerns

Many maintenance program elements are not being implemented in accordance with DOE Order 4330.4B and site procedures. The deficient maintenance program elements identified included measuring and test equipment (M&TE), calibration, preventive maintenance (PM), post-maintenance testing (PMT), document control, and Work Request/Order (WR/O) processing, planning, revision, and execution.

Examples of Deficiencies

The following are typical examples of problems identified through interviews and in a review of documentation packages for recently planned and completed maintenance work activities. Not all conditions were observed in all documentation reviewed, but appeared to be representative of recent performance.

M&TE:

Two conflicting procedures exist describing the M&TE program at Fernald; neither describes the program as currently implemented on site. Required internal program audits, out-of-calibration trending, and assessments are not being performed. The assignment of quality levels discussed in these procedures is unclear and not in accordance with other site procedures. Hold points for M&TE were not being used in WR/Os as required by procedure. There is no list of site M&TE or of site standard traceable calibration devices.

Calibration/PMs:

Calibration records were incorrectly and incompletely filled out (e.g., data not completed, tolerances and procedures used not specified). Data sheets were not attached. Data sheets other than specified in procedures were used. Instrument mechanics performing calibrations signed off for facility owner to authorize work and accept the results. Completed PMs did not contain documentation of the performance of various actions required by the PM, such as inspections, cleaning, lubrication, and adjustments, or of lessons learned, as provided for on the form and in the governing procedure. A status report of open PMs, dated April 19, 1996, reflected numerous PMs that were overdue by more than one year, many dating as far back as 1989.

PMT:

Post-maintenance testing was not always specified where required in WR/Os or was inadequately specified (e.g., no specific instructions or acceptance criteria). There was no documented evidence that specified quality control (QC) inspections and PMT were performed.

Document Controls:

Completed WR/Os have been accepted and filed with numerous errors and omissions. Maintenance work instructions for PMs have not beer reviewed annually as required by procedure. Temporary changes or other compensatory measures have not been taken to address procedures that are known to be deficient.

WR/O Processing, Planning, Revision, and Execution:

- WR/O documentation was incomplete or unclear with regard to the need for walkdowns, PMT, maintenance HOLD points, QC inspections, detailed work instructions, revisions to work scope or instructions, and Occupational Safety and Health approval of Work Permits
- Pre-Job Checklists were incomplete, in conflict with the WR/O, did not address relevant safety and health considerations, were signed off weeks before work performance, and were not signed off by all craftspersons involved in the work.
- The WR/O planning procedure did not provide instructions or controls for changes or revisions of work scope, instructions, or conditions. Work scope or instructions that involve safety considerations have been revised by memorandum without subsequent documented reviews by health and safety personnel, and without additional documentation of pre-job briefings.
- Supplementary documentation such as equipment safety checklists, work permits, and penetration permits were improperly completed or were missing from documentation packages. Two versions of engineering work sketches were contained in a work package with improper revision control.

Summary of Safety Consequences

Failure to follow procedures or to correct deficient procedures and the failure to properly perform WR/O planning, calibrations, post-maintenance testing, and preventive maintenance present additional safety risks to workers and site personnel. These deficiencies could result in unsafe work conditions and practices and unexpected and unnecessary malfunction or failure of safety equipment. Further, the failure to follow procedures and the failure of supervision and management to identify, correct, and prevent these deficiencies do not demonstrate the proper and expected safety culture.

Figure 4. Summary of Maintenance Program Concerns

(maintenance, including maintenance of electrical systems). While these deficiencies are significant and pervasive, they appear to be an exception in otherwise effective implementing programs.

Criterion 2-4 - Assessment Programs

The FN assessment program is defined in the TMP, and more specifically in the Compliance Assurance Plan, which is an addendum to the TMP that specifically addresses measures to ensure compliance with applicable statutes and DOE orders, standards, rules, directives, and other requirements related to public and worker safety and environmental protection. These measures include Facility Representatives activities, conduct of operations assessments, QA audits, subject matter expert assessments, and walk-throughs (e.g., subject matter experts, management and project manager walk-throughs). Fernald Implementing Procedures (FIPs) are used to describe the activities to be performed and the responsibilities of the personnel performing them. The FIP identifies in detail a number of different activities to meet the intent of the TMP. Planning and scheduling of assessments are required and responsibilities are specifically assigned. The assessment program defined in the Compliance Assurance Plan and FIP is conceptually sound.

The FN assessment program is defined in the Technical Management Plan.

Fernald Implementing Procedures define activities to implement the Technical Management Plan.

However, FN is not complying with procedures for some of the assessment activities defined in the TMP and FIP. FN has not communicated expectations to staff on execution of the assessments, development of schedules to support all assessment activities, and tracking and trending of the progress and results of the assessments. Assessments have not been performed according to the specified schedules. Subject matter experts have not developed or implemented a surveillance and audit program to verify FN and contractor compliance to functional area requirements. Delinquent audits or surveillances have not been brought to the attention of responsible managers. In short, FN has not fulfilled this aspect of the TMP requirements, as discussed under Criterion 1-2.

FN is not complying with its own procedures for assessments.

As discussed under Criterion 2-1, the recent FN self-assessment of TMP implementation was superficial and did not identify significant and readily evident problems with regard to TMP implementation. Further, the self-assessment scope, lines of inquiry, and conclusions indicated that it was intended as the Phase 2 assessment of the S/RID (verification that requirements are implemented). However, it falls far short of this scope, and does not meet the intent of Phase 2 S/RID assessment. Further, discussions with FN management and staff indicated that the focus of the self-assessment was only an examination of the FN training and qualification programs and was conducted as a survey of awareness.

The self-assessment did not meet the intent of a Phase 2 assessment of the FN standards/ requirements identification document.

Although FN has not effectively implemented the assessment programs described in its plan, FN does perform a wide variety of assessments; over the last year, there has been an increase in FN field presence through assessment activities. However, the effectiveness of these efforts varies considerably, and FN has not developed an integrated, comprehensive approach to assessing ES&H performance.

FN performs a wide variety of assessments but has not developed an integrated and comprehensive approach.

FN assessments that are at least partially effective include:

- **FN Facility Representative activities,** defined in the TMP, include surveillances, walk-throughs, and assessments. The Facility Representatives have been found to be generally effective and are frequently in the facilities. However, many Facility Representative activities are unstructured and informally documented, with the result that these activities are not very useful for tracking and trending.

- Although **subject matter expert surveillances and audits** are generally not being performed in accordance with the FIP and TMP, assessments are being conducted by the subject matter expert surveillances. For example, a recent assessment of the FERMCO unreviewed safety question determination process was effective in identifying problems, the results of which are being used to improve the program.

- The scope and frequency of the **conduct of operations assessment s** performed by FN have been effective in identifying a wide range of deficiencies in the facilities. The Facility Representatives have taken a lead role in the conduct and support of these assessments.

- FN staff and support services contractor personnel perform **walk-throughs**, which are unstructured reviews of all or part of a facility. Results are often recorded on observation forms that are distributed to appropriate FN and contractor personnel. Walk-throughs are effective in getting more technical staff out to the facilities more often.

- **Management assessments**, which include walk-throughs, have been performed, although their effectiveness varies considerably.

Despite the diverse assessments being performed, deficiencies in the integration and systematic approach to assessments have resulted in gaps in assessment coverage. For example:

Despite the diverse FN assessments, there are gaps in coverage.

- Formal, comprehensive evaluations of contractor and DOE training programs are not occurring as required by FN's TMP and FIP. Evaluation of training is limited to field observation of training classes and occasional assessments initiated as a result of problems identified by external organizations.

- FIPs and the FN TMP are not consistently used by FN industrial safety and hygiene staff in planning and performing their assigned tasks.

- Written FN waste management surveillances of the contractor are infrequent and often cursory; FN performed only one waste management surveillance in the last year.

FERMCO also conducts a diverse set of assessment activities. These include self-assessments, QA program audits and surveillances, reviews by the FERMCO President's Safety Committee, and reviews by the Independent Safety Review Committee. Some of these programs are effective. For example, the QA program includes both formal audits and surveillances; since January 1995, FERMCO has performed more than 550 surveillances. In addition, FERMCO requires that all divisions perform an annual self-assessment. The quality of these programs varies across the site. The Environmental Compliance and Safety and Health Divisions have formalized programs, while the Remedial Support Operations Division's efforts are less formal and less effective. Other programs, such as the Independent Safety Review Committee, are not well supported. This program is intended to perform assessments of all aspects of the Safety Analysis Department, including unreviewed safety question determinations and safety assessments; however, the current scope of activities is limited, and few assessments have been conducted.

FERMCO also conducts a diverse set of assessment activities.

The Independent Review Committee is not well supported, and its activities are limited.

In general, corrective actions and root cause analyses for deficiencies identified at FEMP lacked focus and did not meet procedural requirements. Figure 5 summarizes the concerns in the corrective action processes.

Corrective actions and a root cause analysis for deficiencies lacked focus.

FERMCO created a lessons-learned program to facilitate a process where FEMP workers understand, use, and incorporate the concepts of lessons learned into daily tasks. The program had a history of lack of effectiveness, including decentralized and inconsistent activities. However, in November 1995, a new manager for the sitewide lessons-learned program was assigned, and the new structure of the program appears sound.

Although some aspects are effective, the assessment program requires improvement, most notably in conduct of assessments, corrective actions, and root cause analysis. The various elements of the program need to be performed in accordance with the TMP provisions. An integrated approach to assessments encompasses all organizations and includes the systems used to capture, document, evaluate, correct, track, trend, and prevent recurrence of the adverse findings identified during these assessment activities. This type of integrated approach to assessment of ES&H performance has not been institutionalized at FEMP.

The assessment program requires improvement.

Issue Description

Weaknesses in the structure and implementation of the corrective action programs at FEMP inhibit the timely and effective resolution of program and performance deficiencies and the prevention of recurrence. Weaknesses are exhibited in the handling of deficiencies identified in:

- Operational Event Reports
- FN assessments
- FERMCO self-assessments
- FERMCO corrective action reports and non-conformance reports

Examples of Weaknesses

- Incorrect root cause determinations
- Incomplete root cause analysis
- Inadequate extent of condition determination
- Untimely corrective actions
- Inadequate corrective actions and recurrence controls
- Inadequate documentation and tracking of resolutions
- Failure to hold responsible parties accountable

Contributing Factors

- Lack of consistent, coordinated corrective action policies, plans, and procedures
- Incomplete implementation of FERMCO occurrence reporting requirements
- Lack of formal training requirements for FN and FERMCO personnel who develop, review, and approve root cause determinations, corrective actions, and recurrence controls
- Inadequate/fragmented systems and procedures for tracking deficiencies
- Inadequate verification and validation of corrective actions and recurrences
- Lack of Quality Assurance involvement in the corrective action program
- Inadequacies in depth of assessment and oversight of corrective action as a management system.

Figure 5. Corrective Action Program Weaknesses

the site will be eliminated) also create significant challenges to maintaining the needed skill mix in the workforce.

The two FERMCO reductions in force (in 1993 and 1995) were criticized in a recent report by the DOE Inspector General, which indicated that the restructuring efforts may not accomplish the objectives of reducing staffing and changing the skill mix and cited problems with financial management (e.g., appropriateness of buyouts). The Oversight team also reviewed the restructuring effort, focusing exclusively on the impact on safety.

Criterion 3-1 - Staffing and Qualifications

FN implements most technical management and oversight functions.

The vast majority of the technical management and oversight functions are implemented primarily by FN, with OH providing technical direction and support in some important areas such as training. FN has a staff ceiling of 59 full-time equivalents (up from 38 three years ago) and currently has 54 positions filled. Of these positions, 44 are technical staff and management positions.

Nearly all FN technical staff have degrees in science, engineering, or other technical disciplines, with many holding multiple or advanced degrees. FN has 13 environmental engineers/scientists, ten general engineers, six Facility Representatives, four physical scientists, four safety engineers, two health physicists, one construction engineer, and one industrial hygienist. Three technical positions are vacant. Within OH, the Office of Compliance and Support has a technical ES&H staff of approximately 20 personnel, including two dedicated training positions. FN also has a technical support contract that provides two health physicists, one electrical engineer, one construction safety specialist, and one industrial hygienist.

FN staffing levels, skills, and experience are adequate for current needs.

The staffing levels, skills, and experience of the staff within FN are adequate to perform current technical management and oversight functions. However, increased attention is needed to ensure that staffing is adequate for anticipated needs. Considering the nature of the ongoing and anticipated work, the skill mix may be biased toward environmental science/engineering, which has been the predominant need in the past few years. There are relatively few specialists in construction/demolition and potential shortages in some areas, such as training. Further, FN's support service contract is nearing its end. OH is currently soliciting a new support service contract to provide similar support; however, it is unclear whether the new contract will be in place before the current one expires.

In its September 1995 Strategic Plan, FN management recognized the need to develop a proficient, diverse, knowledgeable workforce with the proper skill mix. A specific action item was included in the plan to annually reassess the skills and needs of personnel and organizations of Fernald. However, a formal analysis of workforce staffing needs has not been performed since OH was created in 1993. Discussions with FN management indicate that a formal analysis of staffing needs will likely be performed this summer in association with a reorganization of OH. The need for this analysis is highlighted by the two recent vacancy announce-

ments, which are intended to fill the three vacant positions. These positions were advertised for environmental engineers or physical scientists. Based on the move toward construction, decontamination, and decommissioning activities and the current staffing mix, there appears to be a greater need for other disciplines at FN.

FERMCO has sufficient, appropriately qualified staff to perform its safety-related functions.

FERMCO has approximately 2,000 employees, including 150 managers and technical staff who are employed by the teaming partners and assigned full time to the Fernald site. Due to the nature of the work, a large portion of the FERMCO professional workforce serves in functions that are directly associated with the safe achievement of the site remediation activities. These positions fall into a broad range of job categories, including project mangers, engineers, construction managers, regulatory specialists, and safety and health professionals. The Safety and Health Division, which includes about 200 technical staff and management positions, is responsible for managing safety and health programs and initiatives within FERMCO and ensuring that operations comply with applicable requirements. FERMCO has established position descriptions that contain the minimum levels of education and experience for each job category employed on the site.

FERMCO has sufficient staff with the appropriate qualifications to perform required safety-related functions. Localized staff shortages were found in only a few areas, including training staff, industrial hygiene technicians, and maintenance personnel.

The workforce reduction effort in 1995 used a systematic process that ranked employees in areas of performance, skills, and the applicability of their skills to current and anticipated needs. Detailed personnel data on education, experience, and professional certification were not compiled for use in the ranking process. Interviews with senior FERMCO managers identified a number of specific cases where applications for voluntary separation were denied because of concerns over the loss of critical skills in certain areas, such as radiological control technicians, industrial hygiene technicians, engineers, and specialized environmental professionals.

On balance, FN and FERMCO have sufficient staff with the appropriate qualifications to perform required safety-related functions, although localized staff shortages and skill mix issues require further attention.

Criterion 3-2 - Technical Competence and Knowledge of Hazards

FN staff are generally competent and experienced.

FN managers and workers interviewed during the evaluation demonstrated a high degree of technical competence and practical experience. The managers have considerable experience with the military, DOE, and commercial and nuclear industries. Managers clearly understand the importance of core competencies and are knowledgeable about the hazards associated with Fernald operations. The same level of technical competence exists at lower layers of FN organizational hierarchy, except for a few individuals in project management. FN is addressing this issue by enrolling those workers in project management courses.

Out of 53 FN staff, approximately 45 have been determined to be subject to the DOE technical qualification program (i.e., the response to DNFSB Recommendation 93-3). All of these individuals have identified and completed the appropriate general technical base and primary functional area qualification records. However, FN's implementation of Recommendation 93-3 is questionable. For example, the method by which functional area standards were selected was contrary to procedures, and managers did not verify the existence of or validate the documentation required for all equivalencies.

FN's implementation of the technical qualification program is questionable.

OH and FN have recognized the deficiencies in the technical qualification program and are working to correct them. An extensive effort is ongoing to collect the documentation needed to validate the qualification standards of each employee. As soon as the required documentation is collected, OH will review the qualification records to determine the type and quantity of training needed to meet the Recommendation 93-3 schedule. Consistent with OH direction, FN expects to certify all GS-14 personnel and Facility Representatives by the end of 1996 and complete other positions (GS-13 and below) by May 1998.

While the FN Facility Representative program has developed slowly, increased emphasis and attention by FN over the past year have yielded significant improvement. The current Facility Representative training and qualification program meets the qualification standard requirements defined by the 93-3 implementation plan and DOE Order 360.1. There is currently only one fully qualified FN Facility Representative. Five Facility Representatives are in various stages of training, and FN expects three of them to be fully certified within three months. Facility Representative trainees are expected to complete their qualification program within 18 months of entry into the program. Evaluations are performed to ensure that Facility Representatives are technically competent and proficient in the assigned facility, including oral boards, written exams, and final facility walk-throughs. Upper-level OH and FN managers participate in the oral board evaluations. Overall, the Facility Representatives' competence and knowledge of hazards and systems for their assigned facilities is appropriate. With the exception of a formal requalification program, FN has established the framework for an effective program.

Facility Representatives have the appropriate competence and knowledge.

FERMCO staff exhibited sufficient technical competence to safely manage the environmental restoration mission. FERMCO workers, ES&H and project managers, and subcontractors exhibited a good understanding of the competence and qualification issues within their organizations. Individuals have appropriate background, training, and site-specific experience. Technical staff and engineers have adequate educational background and technical knowledge for their job assignments. Organization and staff competence for site operations was observed to be adequate.

Most individuals, including managers, engineers, subcontractors, and other project staff, expressed an appropriate level of awareness of health and safety issues and the potential hazards at their facilities. FERMCO lessons-

FERMCO staff were generally aware of safety issues and potential hazards.

learned programs, along with communications such as newsletters, electronic mail, training classes, and postings, are used extensively to disseminate information to workers about potential hazards and safety practices.

Overall, FN and FERMCO personnel exhibited the necessary technical competence, experience, and knowledge of hazards to safely perform their assigned duties. OH and FN are aggressively working to improve documentation and validation of personnel qualifications and to ensure that sufficient certified Facility Representatives are available.

Criterion 3-3 - Worker Participation and Empowerment

Programs to promote worker participation and empowerment are operating effectively.

FN and FERMCO have a number of programs to encourage workers to participate in safety programs, empower workers to work safely, and recognize and reward safe practices and worker contributions. These include the Safety First initiative and the associated safety work groups, employee participation practices and initiatives, stop-work authority, safety briefings, the enhanced work planning pilot, employees concerns programs, and the employee recognition program. These programs are operating effectively with few significant problems. Management support for these efforts was clearly demonstrated, and the programs are helping to achieve a safety-conscious workforce.

Support for the Safety First initiative is particularly notable. This comprehensive initiative was created in 1994 under the joint leadership of OH, FN, and FERMCO. The goal of this program is to provide a safe work environment and create a safety-conscious workforce. DOE and FERMCO management, with the support of the labor unions, have extended Safety First work groups to most of the site workforce. Over 150 individual work groups have been established through all elements of the site workforce, including professional and hourly, and DOE, FERMCO, and subcontractors. The goals of the work group are to get employees involved in the safety process and empower them to take ownership of conditions in their workplace. Each work group selects someone to serve as a safety advocate and to work with supervision to resolve safety issues. DOE has encouraged the use of work groups through the use of award fee criteria.

Management support for the Safety First initiative is notable.

In addition to raising concerns through the Safety First work groups, Fernald employees can raise concerns through other formal and informal channels. For example, a general safety hotline has been established, and the Industrial Hygiene and Radiation Control groups have established hotlines to facilitate timely response to questions and concerns. In addition, both FN and FERMCO have formal employee concerns programs. The FERMCO employee concerns program is functioning effectively, although weaknesses were evident in documentation of resolution of concerns and evaluation of concerns submitted at exit interviews. The FN employee concerns program was found to be weak in the areas of administration and knowledge of requirements.

As part of the Safety First initiative, a rewards and recognition program has been established at FEMP. The goal of the program is to immediately recognize individuals for their exemplary safe attitude, behavior, and actions. All employees, including subcontractors and DOE employees are eligible to receive awards, which are redeemable for prizes. The program is funded ($40,000 for 1996) out of the FERMCO award fee, and FN has contributed to the program to ensure participation of DOE employees. The program has matured over the last several years and is well liked by the employees.

Exemplary safety awareness is rewarded.

While worker participation has expanded greatly over the last two years, interviews conducted by the Oversight team indicated that there is still an element of distrust by some hourly employees, and relationships between union leadership and FERMCO remain strained despite numerous committees and meetings involving union leaders and DOE and FERMCO management. Although strained relationships are not unusual in times of workforce reductions and budget pressure, additional attention is needed to address worker perceptions and union relationships. Labor leaders and hourly workers expressed concern that DOE and FERMCO management should involve labor organizations and union workers in programmatic decisions affecting safety.

The enhanced work planning initiatives have not resulted in increased worker participation in work planning.

Workers' perceptions of the enhanced work planning initiatives were notably different from those of management. The enhanced work planning effort has received significant attention through EH mentoring assistance efforts; it appears to have improved both the thoroughness and efficiency of work planning. However, some workers indicated that the enhanced work planning process had little impact on worker involvement and was not much different than previous efforts in which their first involvement was when they were handed a completed work package. The Oversight team's review of selected work packages confirmed that hourly workers have little involvement in the planning efforts prior to pre-job briefings.

Overall, FN and FERMCO have established a number of effective programs to encourage worker participation and involvement in safety. Additional measures to address worker perceptions and union relations should be considered.

Criterion 3-4 - Training Programs

OH has programmatic responsibility for Federal employee training and oversight of FERMCO and FN training programs. FN has responsibility for implementing training policies and procedures mandated by OH. This division of responsibilities for training between OH and FN appears to be understood but has not been formally documented.

The FN training program generally meets Departmental requirements.

OH and FN have been effective in identifying, locating, and procuring training for Federal employees. The FN training and qualification program generally meets DOE requirements, although some problems were evident with documentation of qualification standards, as noted in Criterion 3-2. The staff of the OH Office of Training has the experience, skills, knowledge, and commitment to manage the FN employee training and qualification program.

The OH Training Manager has informally delegated many assessment duties to various FN groups and provides support as requested by FN. As discussed under Criterion 2-4, FN is not performing comprehensive assessments of training at FEMP in accordance with the TMP and FIP. This deficiency is at least partially attributable to resource allocations (the Office of Training has two Federal employees and three contractor support personnel), and there are no training staff at FN.

FERMCO conducts most of the training provided at FEMP, including training for its employees and some site-specific training for DOE and subcontractor personnel. FERMCO subcontractors and unions provide other required company/project-specific training to their employees to meet qualifications required by FERMCO contracts. A Training Control Board has been established to resolve training-related issues and provide support as needed. The board meetings are valuable and foster good communications and working relationships between the training groups and FERMCO managers.

FERMCO training programs meet applicable requirements and are founded on a formal, performance-based approach.

FERMCO training programs meet applicable requirements, are formalized, are based on best industry practices and modern instructional design methods, emphasize performance-based training, and are developed using the systematic approach to training. A Training Implementation Matrix, which identifies training, qualification, and certification requirements for

individuals, has been completed. It meets the DOE Order 5480.20A requirements and is used to help develop training program requirements. Revision 2 of the matrix is currently in the final phase of approval by FN and OH. This revision will ensure that FERMCO is in compliance with DOE Order 5480.20A. FERMCO is appropriately using mockups, computer-based training, and a sitewide automated data base for tracking and scheduling employee training to enhance training and increase efficiency. A strategic approach for defining, developing, and implementing training on a sitewide basis, which ensures that the quality of training is consistent, was evident.

Training program descriptions and qualification standards at each facility and for most functional areas have been developed and implemented to define training requirements for operators, shift managers, and other positions. Project managers, supervisors, and workers are involved in developing program descriptions and course materials, with extensive support from the training department. The performance-based training focuses on actual job tasks and provides workers with the knowledge and flexibility needed to deal with unexpected conditions.

All training classes begin with students or instructors providing a safety topic for discussion. This practice keeps workers focused on safety. Further, FERMCO has used operational experience to focus training on specific needs. For example, construction-related accident data indicated that a disproportionate number of accidents involved personnel who had been on the job three months or less. Consequently, FERMCO placed additional emphasis on training new personnel being assigned to a construction site.

Operational experience is used to focus training on specific needs.

Although the quality of the training process is adequate for most activities conducted at Fernald, some areas require attention:

Some areas require attention.

- **Line management involvement in evaluating training courses and approval of training program descriptions.** Managers have not approved some descriptions, and supervisors provide comments only if they attend training required by their job position. Approval and evaluation by line management are fundamental and necessary in the systematic approach to training.

- **Worker and manager accountability for attending scheduled training.** Line managers are not enforcing attendance for required scheduled training classes, judging by the high no-show percentage, which has been as high as 60 percent for some classes.

- **Organizational placement.** The central training group occupies a low position within the organization, diluting management attention to significant training-related issues. Further, the training organization does not appear on the re-engineered organization chart.

- **Evaluation of training effectiveness.** The FERMCO training group does not have an extensive evaluation process to assess the effectiveness

of training they provide. Evaluations tend to be post-course student questionnaires, informal critiques, and infrequent peer reviews.

- **Continuing training program.** Continuing training for instructors is not formally scheduled, and its content is not helpful to instructors.

Overall, the conduct, structure, and delivery of training provided by FERMCO are adequate; however, management involvement in and commitment to training need to be strengthened to ensure that the content and quality of training are pertinent to the job tasks a worker is expected to perform.

Overall Evaluation of Principle #3

Overall, the Fernald site is maintaining a workforce with the needed competencies.

With respect to safety, EM, OH, FN, and FERMCO have effectively responded to the considerable challenges associated with transitioning the workforce to its current mission. FN and FERMCO managers and workers have practical experience and a good understanding of facility operations and hazards. With few exceptions, workers generally were safety conscious and knowledgeable of hazards. Continued attention is needed to improve the Facility Representative program and technical qualification program, and increased management involvement in training is needed. Although some weaknesses were evident, FEMP has generally maintained a workforce with the needed competencies and has effectively implemented the four criteria associated with this guiding principle.

4.0 CONCLUSIONS AND RATINGS

The ratings for the three principles and overall safety management program are shown in Figure 6, which also includes the ratings for the individual criteria under each principle. The most significant evaluation findings, both positive and negative, are summarized in Table 7.

Figure 6

Table 7

As the ratings indicate, safety management at FEMP is effective. While some problems were evident, performance was judged to be effective in all but two criteria (roles and responsibilities, and assessment programs). This is a significant accomplishment in light of the challenges associated with managing the transition to an aggressive shutdown, decontamination, deactivation, and decommissioning mode.

Assessments and roles and responsibilities require further attention.

Although the ratings indicate the existence of an effective safety management program, FEMP needs to continue to improve and focus additional attention in the areas listed in Table 7. The most notable problems are in assessments (including FN compliance assessments, corrective actions, root cause analysis, and trending) and clarification of roles and responsibilities (particularly for OH and FN, and for maintenance functions within FERMCO). However, other identified systemic weaknesses, such as those in implementation of the TMP provisions, authorization basis documentation, and communication with workers, should also be aggressively addressed. Although implementing programs are generally effective, weaknesses in the safety management program have impacted the effectiveness of implementing programs, most notably maintenance and electrical safety.

The FN and FERMCO management and workforce have demonstrated a commitment to establishing and sustaining effective safety programs. As a result, they are well positioned to address the identified weaknesses and meet ongoing and upcoming challenges.

APPENDIX A

EVALUATION APPROACH AND TEAM COMPOSITION

APPENDIX A
EVALUATION APPROACH AND TEAM COMPOSITION

EVALUATION PRINCIPLES AND CRITERIA

The three applicable fundamental principles for an effective safety management program are discussed below.

Principle #1 - Line managers are responsible and accountable for safety.

Organizations that have effective safety management programs place accountability and responsibility for safety with line managers. Accordingly, line management personnel must ensure that the safety management program includes safety policies and goals that are clearly articulated and communicated; well defined responsibilities and authorities; effective management systems to identify, analyze, prioritize, and mitigate risks; and a process for ensuring that management is accountable for its safety performance.

The criteria for Principle #1 are summarized in Figure A-1.

Principle #2 - Comprehensive requirements exist, are appropriate, and are executed.

An effective safety management system must include processes to identify, communicate, execute, and monitor all applicable requirements, including Federal and state regulations as well as DOE requirements. Accordingly, responsibility for managing requirements must be established, a hazards analysis process must be implemented and applicable requirements identified and translated to procedures, procedures must be implemented by personnel in the facilities, and systems to assess compliance and effectiveness and to correct noncompliant conditions must be in place.

DOE is in the midst of a significant change in its approach to analyzing hazards and identifying applicable requirements that must be implemented to control those hazards. Most notably, DOE is transitioning from orders to rules. The criteria for Principle #2 are intended to be sufficiently flexible to encompass all of the current and developing approaches to analyzing hazards and identifying appropriate requirements.

The criteria for Principle #2 are summarized in Figure A-2. The following paragraphs clarify the scope of the individual criteria under this principle.

The first criterion focuses on the management functions that are necessary to implement hazards analysis processes. Included in this criterion are functions such as identifying individuals and teams to conduct hazards analyses at various facilities, assuring that the necessary resources are available, prioritizing activities, reviewing progress and status, maintaining documentation, establishing configuration control, evaluating and approving site-specific processes, and determining whether expectations are being met. In short, the first criterion focuses on the infrastructure underlying the second principle.

The second criterion focuses on the effectiveness of the actual process for analyzing hazards and identifying requirements. It encompasses the processes for translating the applicable requirements to site- and facility-specific procedures, and for updating those procedures as conditions change. The emphasis is on whether the processes used at the site are achieving the desired goal, which is a set of requirements and procedures that, if implemented, will effectively control the hazards. Also important is whether the site has a formal, current authorization basis for its facilities and whether the site is meeting established commitments for developing such an authorization basis.

Principle #1 - Line managers are responsible and accountable for safety.

Criterion 1-1: Clear Safety Policies and Goals

Line management implements effective safety policy and goals that reflect Departmental policies and industry standards and assures a safety culture that permeates every level of the organization.

Criterion 1-2: Defined Responsibilities and Authorities

Line managers are responsible and accountable for ensuring that DOE facility operations and work practices are performed in a manner that provides adequate protection to worker safety and health, the public, and the environment. Accordingly, line managers must ensure that:

- A clear division of responsibilities is established and communicated.
- Line managers have the authority to make and implement decisions regarding ES&H that are commensurate with their responsibilities.
- There are clear mechanisms throughout the line organizations for adjudicating disputes among line managers where discrepancies are believed to exist between work goals and ES&H management needs.

Criterion 1-3: Project and Resource Management Systems

Decision makers at appropriate levels of the organization must be capable of understanding and synthesizing program goals and ES&H risks in order to effectively deploy resources adequate to address both. Line managers must manage safety and its attainment by establishing management information systems to ensure that:

- Hazards are analyzed and understood.
- Appropriate hazard mitigation actions are identified and are in place.

Criterion 1-4: Line Management Accountability for Performance

Line managers are accountable for ES&H performance. Performance should be explicitly tracked and measured, and inadequate performance should have visible and meaningful consequences. Line managers must execute actions to attain and continuously improve the safety of their operations by ensuring that:

- Safety-related matters are reviewed, monitored, and audited on a regular basis.
- Findings resulting from these reviews, monitoring activities, and audits are resolved in a timely manner.

Figure A-1. Criteria for Principle #1

Principle #2 - Comprehensive requirements exist, are appropriate, and are executed.

Criterion 2-1: Requirements Management

Processes must be in place to ensure that requirements are identified, transmitted, and implemented, and that they provide adequate protection to worker safety and health, the public, and the environment.

Criterion 2-2: Hazards Analysis

Hazards generally change as a facility cycles through the phases of design, construction, operation and maintenance, decommissioning and decontamination, and environmental restoration. It is thus important to continually analyze and assess hazards in order to identify the relative significance and application of Department requirements. To effectively mitigate hazards, line managers must ensure that:

- Requirements are established that are commensurate with hazards throughout the life cycle of the facility.
- Internal requirements are based on hazards analyses and, when implemented, are sufficient to ensure safety.
- Site-specific implementation plans and associated operating procedures define standards that will be used to comply with applicable safety requirements.
- The site is in compliance with applicable Federal and state statutes and Departmental policy and requirements.

Criterion 2-3: Implementation of Requirements

Line managers are responsible for ensuring that programs are implemented in compliance with defined requirements.

Criterion 2-4: Assessment Programs

Line management must establish and implement effective methodologies to monitor, review, and evaluate adherence to all applicable Departmental requirements and industry standards for safety and to achieve timely correction where warranted.

Figure A-2. Criteria for Principle #2

The third criterion focuses on implementation of requirements sitewide and at specific facilities. The emphasis is on whether the requirements are understood at the working level, and implemented as intended.

The fourth criterion encompasses the various programs that assess compliance and effectiveness and provide feedback to line management. These include self-assessments, surveillances, audits, quality assurance, management walk-throughs, and similar formal and informal measures.

Principle #3 - Competence is commensurate with responsibilities.

A fully functioning safety management system will have workers and managers who are technically competent to perform their jobs and who are appropriately educated and knowledgeable of the hazards associated with site operations. Management must assure that effective training programs are in place and that sufficient qualified staff are available. Workers must have the technical capability to recognize and respond to workplace hazards. Active worker participation in maintaining and improving the safety and health of workers, the public, and the environment, including workers' ability to stop work when unsafe practices are recognized, is essential.

The criteria for Principle #3 are summarized in Figure A-3.

EVALUATION METHODS

Each of the guiding principles that constitute the basis for establishing an effective safety management program is a crucial element of a process to ensure that DOE-controlled operations are performed in a manner that will protect workers, the public, and the environment. Using these principles and their associated criteria to evaluate safety management program effectiveness requires careful consideration of the nature of the specific activity or facility being reviewed, its relationship with and impact on other activities and facilities, its life cycle phase, and the risk it presents to adversely affecting ES&H goals.

While the significance and application of each principle and its associated criteria may vary by circumstance, it is imperative that the implications of each principle for effective safety management be weighed and considered on the basis of hazards and risks to workers, the public, and the environment.

The guiding principles are interrelated and mutually supportive elements of the overall safety management system. Clear articulation and communication of lines of authority and responsibility for safety must consider and correlate with the establishment and implementation of appropriate requirements. Personnel responsible for executing these requirements must understand the hazards and their roles in controlling the hazards, and must be competent to perform their assigned duties. Hence, the evaluation of the safety management system must consider the guiding principles both individually and in concert.

The process for evaluating the effectiveness of each guiding principle is as follows.

First, the evaluation results are sorted and binned according to the individual criteria, and each criterion is evaluated and rated individually. Next, each principle is evaluated according to the associated criteria, considered separately and collectively—that is, the evaluations of individual criteria results are "rolled up" to a higher level evaluation of the individual guiding principles. Finally, the overall safety management program is evaluated and rated by "rolling up" the evaluation of the individual guiding principles.

The rollup process is not a mechanical or numerical scoring exercise. Rather, it is a deliberative process involving all levels of the Oversight evaluation team, from the inspectors who

Principle #3 - Competence is commensurate with responsibilities.

Criterion 3-1: Staffing and Qualifications

The organization supports effective safety management by assuring appropriate levels of staffing and competence at every level. The organization has in place the means to:

- Determine the appropriate levels of staffing, experience, and training for each function, including consideration of responsibilities, activities, hazards, and schedules.
- Assure that subcontractors employed on site are adequately trained and qualified on job tasks, hazards, and DOE and contractor safety policies and requirements.
- Clearly identify vertical and horizontal lines of interface, communication, and support.
- Provide managers and supervisors with sufficient authority, staffing, and support to implement assigned responsibilities, analyses, and decisions.
- Develop and implement strategies for recruitment and retention of competent personnel.

Criterion 3-2: Technical Competence and Knowledge of Hazards

Workers and managers are technically competent to perform their jobs and are appropriately educated and knowledgeable of the hazards associated with site operations. Line managers must ensure that:

- Workers have the technical capability to recognize and respond appropriately to workplace hazards.
- Management, technical staff, and workers have the necessary levels of education, training, and experience.

Criterion 3-3: Worker Participation and Empowerment

Line managers recognize that active participation by workers is essential in maintaining and improving protection of worker safety and health, the public, and the environment. Therefore, line managers must ensure that:

- Workers and managers are empowered to take appropriate action in the face of hazards encountered during normal and emergency conditions, including the right to refuse unsafe work assignments.
- Processes for raising safety issues are established.
- Incentives are in place to promote a safety-conscious culture and worker participation and involvement in safety management.

Criterion 3-4: Training Programs

Line managers must establish and implement processes to ensure that training programs effectively measure and improve performance, and identify additional training needs.

Figure A-3. Criteria for Principle #3

examine individual facilities and topics to the evaluation team management and the Deputy Assistant Secretary for Oversight. The rollup evaluations consider:

- Whether risks to ES&H currently exist or will exist in the future if present circumstances remain unchecked
- Whether the risks are unique to a specific criterion, principle, activity, or facility
- The synergistic effects of two or more principles or criteria
- Initiatives that are in progress or are planned, and their expected results
- The impact that the level of adherence to a specific principle or criterion has on the effectiveness of the overall safety management program.

In practice, the evaluation process involves a number of iterations to assure that the results are valid and representative of the Fernald safety management program.

At all stages of the process, the preliminary results were shared with representatives of Fernald. Their comments on the factual accuracy and completeness of the data were used to determine the validity of the data and guide additional data collection efforts as appropriate.

EVALUATION PROCESS

The Office of Oversight's evaluation process measures the effectiveness of DOE and contractor line management in achieving ES&H objectives. The goal of this approach is to fairly and accurately assess the effectiveness of the site's overall safety management program in a way that provides value to line management.

This process focuses on safety management in the context of the guiding principles rather than on serial evaluations of individual issues or technical disciplines. The Office of Oversight strives to provide a balanced assessment of performance, emphasizing strengths as well as weaknesses. Rather than a list of non-compliances or specific deficiencies, evaluation results discuss root causes, systemic weaknesses, obstacles to improvement, and suggestions for approaching solutions. The program actively seeks and incorporates the insights and concerns of line management, workers, regulatory bodies, and other interested parties.

Evaluation of the safety management program at Fernald was based on an assessment of the effectiveness with which line management executes the guiding principles. Measurement of the effectiveness of implementation of ES&H requirements was guided by the criteria associated with the guiding principles.

The evaluation was conducted according to formal protocols and procedures, including an Appraisal Process Guide providing the general procedures used by the Oversight program for conducting inspections and reviews, and a Safety Management Evaluation Plan, outlining the scope and conduct of the evaluation of the Fernald site. Training sessions were conducted to ensure that all team members were informed of the evaluation objectives, procedures, and methods. The evaluation team collected data through interviews, document reviews, walkdowns, observation of activities, and performance testing. Interviews were conducted with EM, OH, FN, and contractor personnel, including managers, technical staff, hourly workers, and union representatives.

Based on the review of documents and tours during the planning process, the Oversight team focused primarily on the Vitrification Pilot Plant; the Building 64 and 65 thorium overpacking project; safe shutdown of Plant 5; and decontamination and decommissioning of Plant 1. During the planning process, the Oversight team identified a number of focus areas: employee involvement in safety and health programs, control of subcontractor ES&H performance, staffing and critical skills, and hazards analysis and authorization bases.

The priorities and focus of the Oversight evaluation centered around the site facilities, hazards, vulnerabilities, issues, and ongoing activities. Performance weaknesses, vulnerabilities, and data needs were

examined for all major Fernald facilities and major ES&H topical and functional areas. Available data from other sources, such as DOE Headquarters and OH appraisals, EH Resident surveillances, Defense Nuclear Facilities Safety Board letters and trip reports, information from the Occurrence Reporting and Processing System, and the Performance Indicator Program, were included in the scope of this evaluation.

Templates for collating data on a daily basis were used as an internal team communication and analysis tool. Weaknesses, strengths, and other indicators were entered into the template on a daily basis and used for coordinating the flow of data. The template was designed for ease of analysis relative to a specific guiding principle and associated criteria. This analysis formed the basis for integrating information, identifying management issues, rating performance under each guiding principle and its criteria, and writing the evaluation report. The analysis of data also provided the basis for redirecting the team during the evaluation, as necessary. The information was evaluated and analyzed daily by evaluation team management and the management team.

The emphasis throughout all phases of the evaluation was on ensuring that data collected were valid and accurate. Key facts and issues were reviewed daily with site points of contact to verify their accuracy. Team management provided daily briefings to site management on emerging issues.

Based on observations, the team analyzed the effectiveness of performance in each criterion and associated attributes for each of the guiding principles. Results and conclusions were documented and ratings assigned. The team evaluated potential options for improving operations and generated candidate actions for enhancing the Fernald safety management system. Finally, the report was reviewed by a management review board consisting of senior analysts and managers who ensured that the reported results reflected objectivity, comprehensive analysis, and supportable conclusions. The results of these efforts were provided in a draft report to DOE management for factual validation at the exit briefing.

TEAM COMPOSITION

To reflect the emphasis placed on the three guiding principles of safety management, a core group of six safety management specialists evaluated the application of these principles at the Fernald site, with two specialists focusing on each of the three guiding principles.

In addition, a team of ten specialists was designated to evaluate safety management at the facility level and the effectiveness of various implementing programs. The facility team included personnel with expertise in radiological protection, conduct of operations, waste management, construction safety, electrical safety, industrial safety/hygiene, maintenance, occupational health/medical surveillance, and quality assurance.

Criticality safety was also reviewed during the planning phase. This review indicated that a more detailed evaluation was not warranted because of the low risk of criticality at Fernald; the low risks are attributable to both the controls in place and the nature of the materials at FEMP (i.e., most uranium is less than 2 percent U-235; at this enrichment an accidental criticality is extremely unlikely).

Team composition is listed on the following page.

Deputy Assistant Secretary for Oversight

Glenn S. Podonsky

Associate Deputy Assistant Secretary

Neal Goldenberg

Director, Office of ES&H Evaluations

S. David Stadler

Team Leader

Michael A. Kilpatrick

Deputy Team Leader

Thomas O'Connor

Management Responsibility

Robert Freeman
Raeanne Reid

Comprehensive Requirements

Patricia R. Worthington
Roger Griebe

Competence Commensurate with Responsibility

William Eckroade
Frank Cicchetto

Facility Safety Management

Thomas Staker - Facility Team Leader
David Allard (radiological protection)
Donald Neal (waste management; packaging and transportation)
Ching-San Huang (waste management)
James Lockridge (industrial safety/industrial hygiene)
Prakash Kunjeer (construction safety)
Marvin Mielke (occupational health/medical surveillance)
Dennis Godbee (conduct of operations)
Mark Good (electrical safety)
Robert Compton (maintenance)
Karl Feintuch (quality assurance)
Ivon Fergus (criticality safety)

Administrative Team

Mary Anne Sirk
Tom Davis
Barbara Grimm
Gary Koch